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Apple Orchard™

The Premier Magazine for Apple Computer Users

VOLUME 3 NUMBER 2

MAY-JUNE 1982

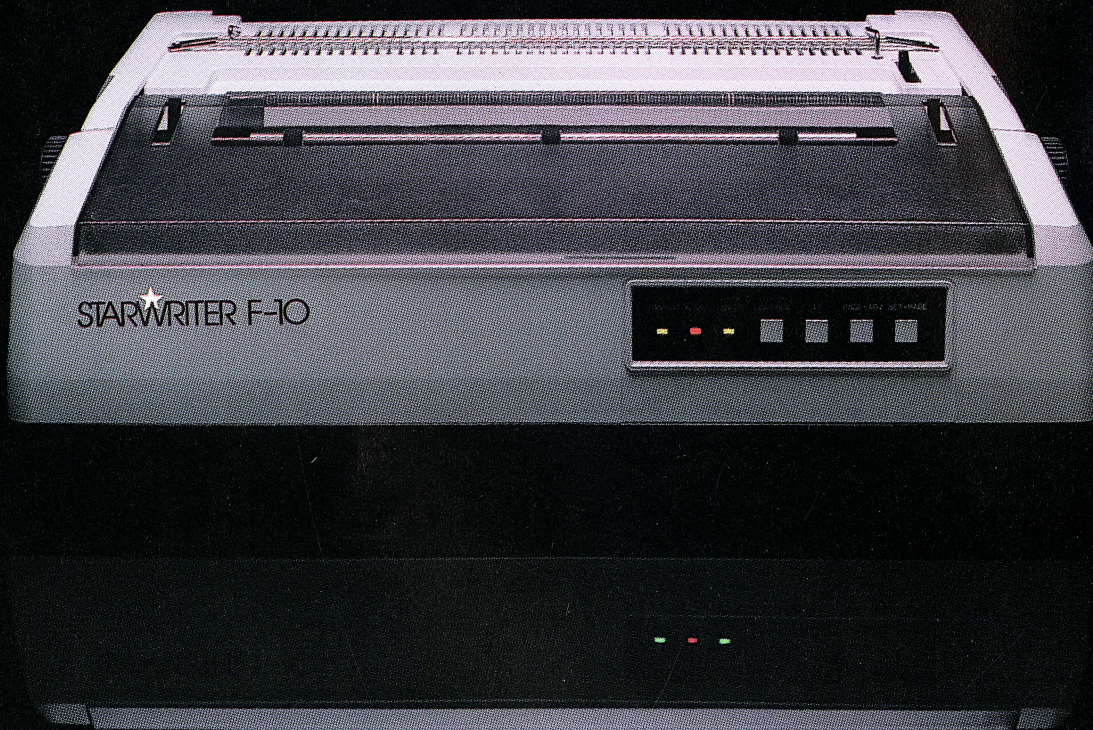
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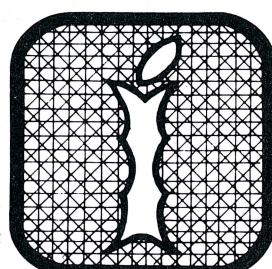
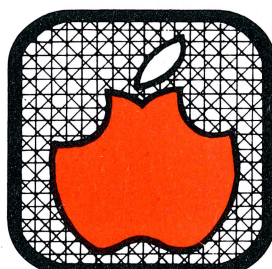
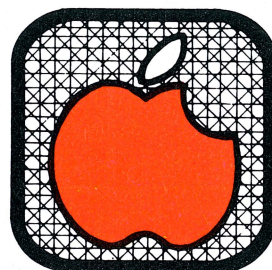
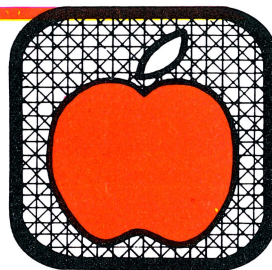
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Vol. 3, No. 2

May - June, 1982

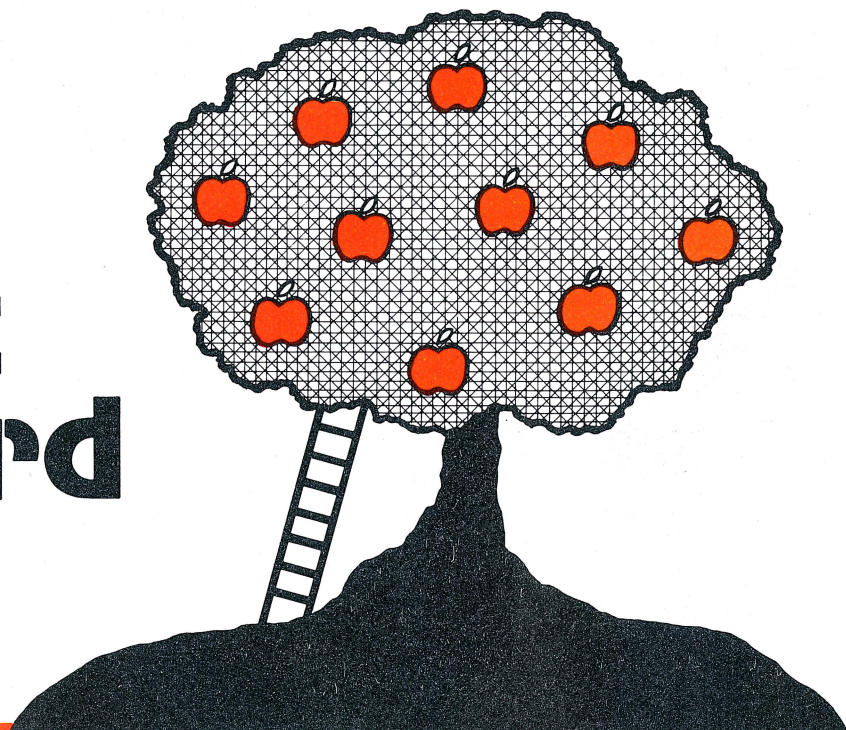
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Peter C. Weiglin—Editor and Publisher
Ingrid Worthge—Art Director
Val J. Golding—Editorial Associate
Mark L. Crosby—New Products Editor
“Dr. Wo”—Pascal/Languages Editor

EDITORIAL MATERIAL TO:

Apple Orchard
910 A George St.
Santa Clara, CA 95050
(408) 727-7652

ADVERTISING REPRESENTATIVE

Jeff Ginsberg
(213) 450-0056

SUBSCRIPTIONS—DEALER INFORMATION

Apple Orchard
910 A George St.
Santa Clara, CA 95050
(408) 727-7652

Karen Vanikiotis—Circulation Manager

INTERNATIONAL APPLE CORE

Officers

Jerry Vitt	Chairman	(214) 369-7660
Ken Silverman	President	(408) 727-7652
Dave Gordon	Vice-President	(213) 709-1202
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Joe Budge	Secretary	(919) 489-4284

Regional Directors

Roger Keating	P.O. Box 448, Double Bay 2048, NSW, Australia
Auby Mandel	409 Queen St. W., Toronto, Ont., Canada M5V 2A5
Wolfgang Dederichs	Auf Drenhausen 2 4320 Hattigen, West Germany

Harlan G. Felt	(Northern United States)	(408) 866-1733
James E. Hassler	(Northern United States)	(307) 632-4934
Jerry Vitt	(Southern United States)	(214) 369-7660
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TEXTFILE

Well, here's the *second* issue of **Apple Orchard** published from our Santa Clara home office. At 112 pages plus cover, it should validate everyone's hopes that we have in fact become a bi-monthly publication. We're gratified by your response to the March-April issue. We're also not standing still; the **Apple Orchard** is continuing to expand, with your support and participation.

And did we get comments on the philosophical observations, the unbashful opinions, the penetrating analyses of the computer? Naah. We got comments on the cover photo, namely the dirty fingernails on the Grubby Paws of the Future. Even got accused of running a dirty book. Well, the photo shows the typical condition of the paws on a more or less typical 9-year old male, immediately before discovery by his mother. Reality ain't always pretty, friends.

This issue, Neil Lipson, the IAC's Software Chairman, naturally writes about...er, hardware. Specifically, the Diablo printer, which is *the* letter-quality workhorse. Thanks too to the Diablo folks for the photos and other information, despite the fact that some of Neil's opinions may not fit into their marketing plans.

There has been much discussion of the "transportability" of the Pascal language. This issue, Paul Sand describes some "features" of Apple Pascal, and the redoubtable Dr. Wo covers some different available versions of Pascal. In the July-August issue, Bill Shepard will provide a unit that allows the user a far greater measure of independence from specific hardware.

And before the BASIC user feels totally left out, we have what has to be the prettiest of "prettyprint" programs we've seen for listing programs in BASIC, thanks to David Bartley. This one is a great help if you've ever puzzled over a printout of your latest program, with multiple statements in one program line, trying to figure out what goes where. The article appeared in much shorter form in the *Apple-Dillo*, the newsletter of the San Antonio Appleseed group; Mr. Bartley is its Editor. (Note that we will adopt this routine for use elsewhere in the magazine.)

As always, we invite your comments.

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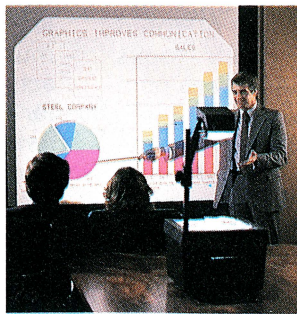
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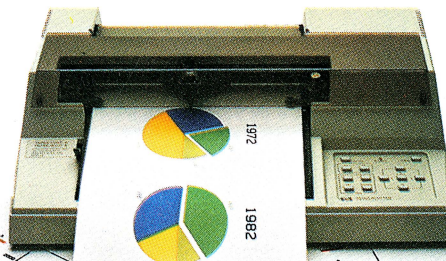
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PRINT FRE(ED)

by Val J. Golding

What's this I hear about Pyrex? . . .

The subject of piracy and protection has been mercilessly beat to death in the magazines, all of which, up till now, has accomplished little. We would like to feel these are the last words we need to pen on a matter that seems almost to border on the obscene, by virtue of its over-coverage. If you are a glutton for punishment, read the feature section in the April 1982 *Call -A.P.P.L.E.* Dr. Lingwood offers what we believe is the only practical recourse for software manufacturers; Mark Pelczarski, president of Penguin Software joins with consumers and asks us to not abuse the trust he has shown in us by *non-protecting* new software releases.

We have written and released one commercial program, our *Directory Title Writer* utility. Recently a major bug was brought to our attention, and while correcting

that, we also removed the limited protection that was originally on the disk. We ask again that the industry, and particularly those who produce business-oriented programs, remove their locks and/or supply backup copies on a timely basis.

We have tried assessing blame in the past; it seems somewhat fruitless. We cannot change what has been and what is.

Or can we.

We have been to many club meetings of different user groups; we have witnessed copyrighted programs being traded; others have experienced similar scenes. We have heard the old story: "I gave it to my friend because he never would have bought it himself." That is a false assumption, one in which we can never determine the truth unless we do not give that copy away.

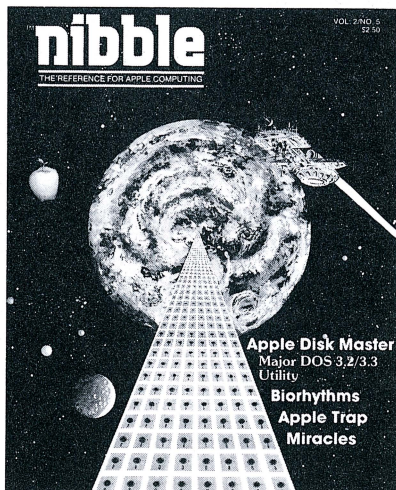
As IAC member clubs, and as individuals, we have an obligation to our members, and to ourselves, to not avert our eyes. We must be able to live with ourselves, and we must realize that every individual action has potential consequences far beyond the limits of our imagination. We have already seen some results in the form of constantly increasing prices.

Each IAC member club, upon filling out their application blank, swears they will not condone the duplication of copyrighted programs. The IAC has not the manpower, nor would they want to be a Scotland Yard of software. Thus, as member clubs, we must lead the way and set examples that not only set our own minds at ease, but can also serve to guide others.

"That's *pirates*, Emily."

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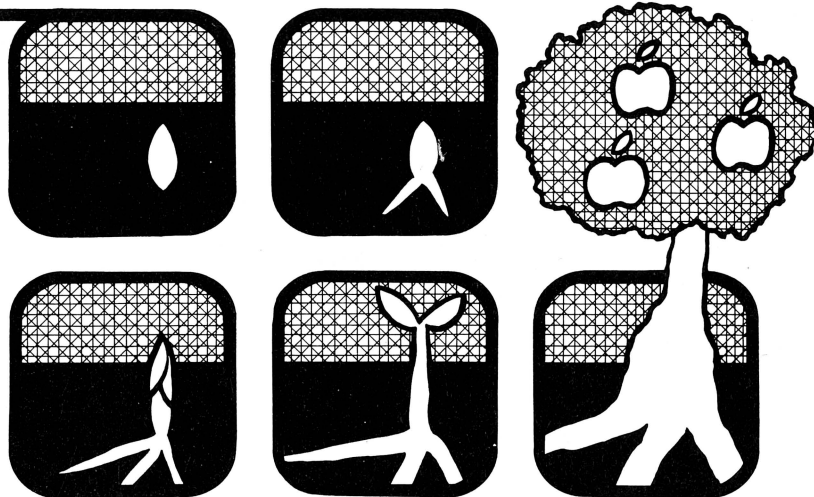
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Planting a seed...



THE VANISHING HACKER

Do you remember the "hacker," also known as the computer hobbyist? There he sits, late at night, programming, probing the machine's inner depths, sometimes cursing softly, others shouting ecstatically. The machine does what you *tell* it to do, not what you *want* it to do.

The hacker can easily be picked out of a crowd; he (or she) is the one who bought an Apple for its own sake; who survived the "Whatcha gonna doowiddit" inanities, and who gradually conditioned the machine to serve human needs. Sometimes by force. There was pride at the first successful simple BASIC program, and a growing competence on the part of the hacker. Explore Pascal? Maybe even venture into machine language? Sure, why not? It's even possible that the hacker's efforts filled some need in the marketplace, spawning a "basement" business or "cottage industry."

It was probably inevitable, but in today's Apple world, the hacker is said to be vanishing from sight. He is being overwhelmed by the "users," who didn't buy Apples for the fun (!) of it, but to use the machine like any other appliance, for a job of work that had to be done. There is no interest there in pushing back frontiers; just keep up the inventory and that will be enough, thank you.

But the "hacking" process goes

through stages of development too . . . and there was a creativity born of necessity in the early days of the Apple II phenomenon that we see less of today, because there is more, and more refined, material available. Hacking is no longer necessary to achieve rapport with the Apple II.

Net result: fewer people become *hackers*, although more people are *users*. Ask the market researchers; they'll tell you that the hobbyist is not the marketplace. In fact, "hobbyist" is almost a dirty word to the corporate newcomers in their three-piece suits, come to profit where hackers blazed the trail.

We owe thanks to the hackers for the microcomputer. No large or even medium sized corporation brought it forth, although these are now stressing the bandwagon to near its weight limits. Of the hackers who gave this industry its start, some have been rewarded beyond dreams; others have been forgotten, or have had to endure seeing others receive acclaim not altogether due them. Growth and corporateness has become inevitable, and that is not a climate in which hackers flourish.

Apple The Company is a classic example of sudden growth and the human problems that accompany it. The attempt to impose the institutional structure of a large corporation

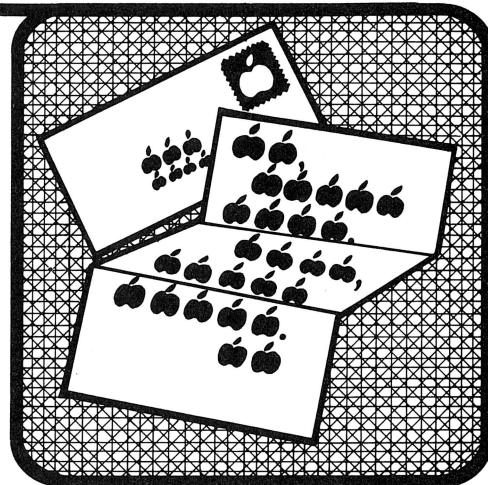
on what conventional business wisdom calls "Camp Runamok" is, frankly, a battle, to be won only at great cost. Meanwhile, the "hackers" who created Apple The Company are leaving; most notably co-Founder and hacker folk hero Steve Wozniak.

'Twas ever thus; Watt, Newcomen, Cooper, the Wrights, Ford, were all hackers. T. A. Edison was a "hacker" of the first water, unconcerned by the politics of the Corporate Research budget. And he too was cast aside by the corporate grayness that survives, "bringing good things to life" today.

From a societal standpoint, it's probably better to have more than 500,000 people improving their lives somewhat as users, than 10,000 hackers, consumed by an electronic passion but operating in relative obscurity. So the market is better for everyone.

And has the "hacker spirit" really been done in? Fat chance. Just check out the Apple /// Group, which displays those telltale pioneering overtones. No, if the hackers "vanish" at all, they vanish like a scouting party; over the horizon, ahead of the rest of us.

Letters to the Editor



Copy Protection

Sir:

Kudos to Andent, Inc. for their continued sale and support of software without copy protection (Letters, **Apple Orchard**, March-April 1982). It seems that other software companies are coming around to the realization that such "protection" actually costs them more sales than does the piracy.

As manufacturer of the original Lower Case Adapter, I have had over 100 calls asking whether the LCA is compatible with VisiCalc. I have to answer that the LCA doesn't *interfere* with VisiCalc, but that there won't be lower case type. And, because VisiCalc is copy-protected, I don't know how to modify it to utilize lower case.

I would like to use VisiCalc myself, but have not purchased it for two reasons: I can't allow my business to be dependent on a software package that can't be backed up, and nearly all of my work is done on 8-inch disks, and VisiCalc can't be "moved up" to the bigger disks.

I can't imagine any business knowingly tying itself to a product that can't be backed up, regardless of how good the product is. And what if a business does start using a product, then later needs more disk space?

Dan Paymar
Durango, CO

Mail Orders

Sir:

We find the no-mail order policy recently implemented by Apple Computer very distasteful.

Apple's new policy was described as an effort to provide consumer education and promote customer satisfaction. This is patently false, and we're surprised that Apple would think that a group of computer users would fall for it. There is also the question of restraint of trade, which

the courts can handle, but the first point made can be addressed here.

By removing the mail-order houses from the marketplace, the customer is forced to buy at retail stores, where the prices are generally higher. Limiting a consumer's options is never in his best interest. Further, because a large portion of Apple's current "family" became members by mail, this can't help but have an effect on Apple's market share.

The claim that "only the retail stores can provide the necessary service and education" is based on a faulty assumption: that the retail stores can and do provide this service. In the areas of both sales and service, many stores just have not justified Apple's confidence in them. A good retailer is rare, and most are poor at applying their products to the needs of the user. They *are* good at developing schedules of high prices, though.

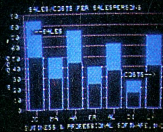
The "customer satisfaction" that Apple is trying to improve would be better served if Apple leaned on its retailers, rather than removing a spur to better performance. The consumer who orders by mail *knows* that he can't get personal service; his eyes are wide open.

And, if Apple enforces the mail order ban, how will someone outside of a metropolitan area purchase equipment? For that matter, what if any store is out of stock?

We do support our retailers when they have products and services we can use, given price and availability

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considerations, but we do not consider any store to have a claim on our business. We buy at stores where the personnel are helpful and well informed; these are all too few.

Overall, the wide and unconstrained distribution of Apple products can only improve Apple Computer, Inc. and Apple user satisfaction. The problem of lack of support is not a mail order problem.

NOVAPPLE
Burke, VA

(This letter, in expanded form, was also sent to Apple Computer, Inc. We welcome your comments on what could be a boon or a mistake. -PCW.)

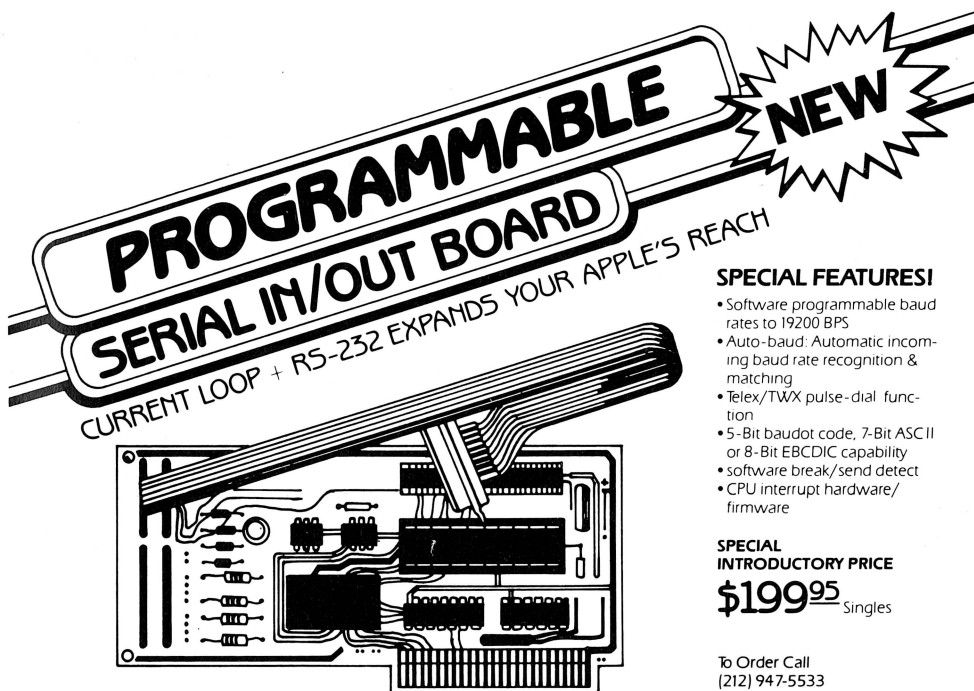
"Underworld" Reply

Sir:

During my recent visit to the Midwest, I toured a former House of Negotiable Affection like the one you mentioned in March (*Planting a Seed: The Underworld Apple*). The establishment, known as "Bitsy's", had indeed been automated to a remarkable degree. According to police, Bitsy had used Peachy Software's "Bedroll" package for her customer list. For financial records, she had used a General Lecher system from Supplesoft. In addition, each visiting room had been equipped with its own personal computer; with their reliability, there was very little downtime. The most popular software, as you might expect, had been "VisiTricks"; "Sleazywriter" and "Snuggle" had been common also. According to undercover agents, favored customers enjoyed Bitsy's selection of "The Ultimate One", "Mistress Command", "Lovesmith", and "Sup-R-Leather". Police found out about the operation when a computer accidentally dialed up the Vice Squad while running "Ask Me Express".

Allan B. Fid
Bat Cave, NC

Well, we asked for it, didn't I?—PCW.)



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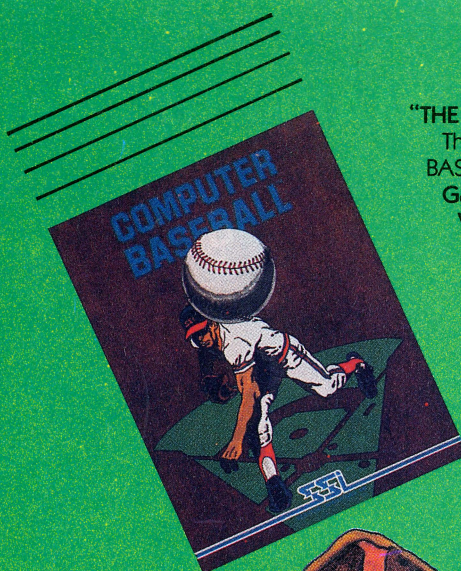
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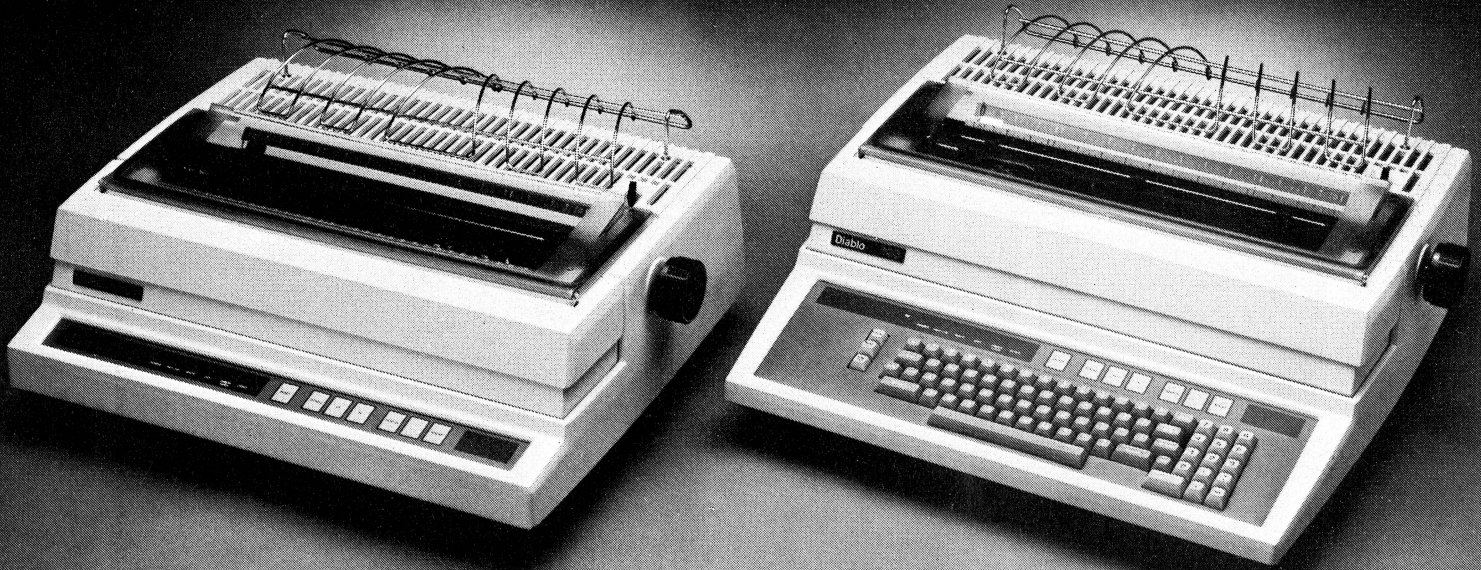
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MAKE THE DEVIL DO IT!

The Diablo Printer and the Apple Computer

by Neil D. Lipson



It is generally believed (particularly by people who own them!) that the Diablo printers represent the ultimate in dependability and letter quality character output. They're made by a subsidiary of the Xerox Corporation, and are "daisy wheel" type printers. The characters are formed by the impact of raised letters around the circumference of a print wheel, rather than a multi-wire dot matrix print head. Thus, the letters are generally better-formed; they're indistinguishable from those produced by a good typewriter, which is the "letter-quality" standard. In fact, the Diablo mechanism is used on Xerox's word processor printers. It's a top of the line printer, with prices to match for the heavy-duty models. What we'll try to do in this article is to summarize many of the hints, tips, and tricks which may help you to interface the Diablo printers to your Apple II. We'll also provide other pertinent information on this printer.

Interfacing

Any and every printer you connect to a computer requires some kind of interface connection; let's consider this before going into the printer itself. While there are some diehards who have connected printers to the game I/O port, the normal interface is with a card plugged into one of the Apple's eight peripheral slots. For the Diablo, the first recommendation for minimize trouble is to use the Apple High Speed Serial Card, Catalog No. A2L0008. Make absolutely sure, when you purchase the card, that it comes with the P-8A PROM chip, not just the plain P-8. (It's rumored that there is later version, but there is no hard information on it at this time.

The card should go in peripheral Slot 1. It could be any slot, but Slot 1 has been established by custom, and much software is configured for that location. In fact, Slot 1 is necessary for proper operation with Apple PASCAL.

With the Serial Card, make sure you get the addendum manual for use with letter-quality printers. This explains the use of the P-8A PROM, and has some in-depth technical notes. Also covered is the setting of the seven DIP (dual-inline pin) switches in a little box on the card. Switches 1, 2, and 3 control the baud rate, or data transmission rate. Switch 4, when OFF, keeps the Apple from sending characters when the Diablo isn't ready. Switches 5 and 6 control the width of the printed line, and Switch 7, when ON, keeps the Serial card from generating extra linefeeds. So, for a normal setting, with a 1200 baud data transmission rate and 40-column line width, the setting of the DIP switches is:

Switch Status

- | | |
|---|-----|
| 1 | OFF |
| 2 | OFF |
| 3 | ON |
| 4 | OFF |
| 5 | ON |
| 6 | ON* |
| 7 | ON |

Notice that Switch 6 is marked. If you leave this ON, by selecting either the 40-column or 72-column line width, you'll be able to see the output on your video screen while printing (set at the 40 character width). With any of the other settings for the combination of Switches 5 and 6 (refer to page 16 in the Serial Card manual) you will not see the video while printing. For some programs, however, such as the Graphics Printing System that does "dumps" of a Hi-Res screen image to the printer, you must have the line width set to 80 characters, which is Switch 5 ON and Switch 6 OFF.

There is one problem with the High Speed Serial Card if your Apple also contains a Hayes Modem. If you put the Serial Card in Slot 1, then don't put the modem in Slot 2, even though that's what Apple The Company recommends for operation with PASCAL. Electronic signals on the two cards sometimes interact with each other in unintended and strange ways. I have been told by a reliable source that the modem can be moved to either Slot 4 or Slot 7, and it will still operate with PASCAL. Mine is in Slot 4, but as of yet I have not tried it with PASCAL.

Which Diablo Model?

Next comes the decision on which Diablo model to buy, and why. (We're assuming here that you have already eliminated other printers.) You have a choice of Diablo models 1640, 1650, 630, or possibly a used 1620. The 1600 models can come with ("KSR"; keyboard send/receive) or without ("RO"; receive only) the keyboard. The 630 comes as an RO model only; no keyboard. Personally, I like a keyboard on a printer, for a few reasons. First, you can use the printer as an independent terminal with the proper modem without even using the Apple at all. In addition, you can use it as a typewriter, although it is not quite the same as an expensive electric typewriter. The reason is that to see what you are typing, you must leave it on the "scroll" select. The resulting up-and-down shifting of the paper can drive you slowly crazy after a while, so you turn it off, but then you can't easily see what you're typing. However, it can work this way if you want to, and it quite often helps if you have only a short line or an address to type.

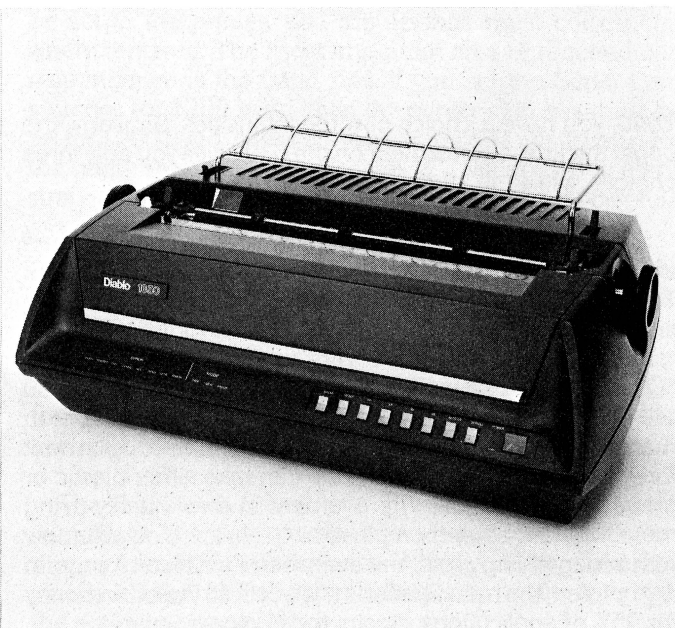
With the keyboard option, you can easily set the vertical and horizontal motion indices (more on this later). However, one important reason for a keyboard is that with the **IN#1** command you can type to the Apple from the Diablo and have a written copy of your program or whatever while you're typing. The Apple video will show what you are typing. Further, you can type upper and lower case, and even the forbidden characters like the reverse Applesoft prompt. In addition, the Diablo keyboard comes with a numeric keypad, and this in itself can be priceless for some situations. The KSR or keyboard option costs about \$150 more, and it's worth it.

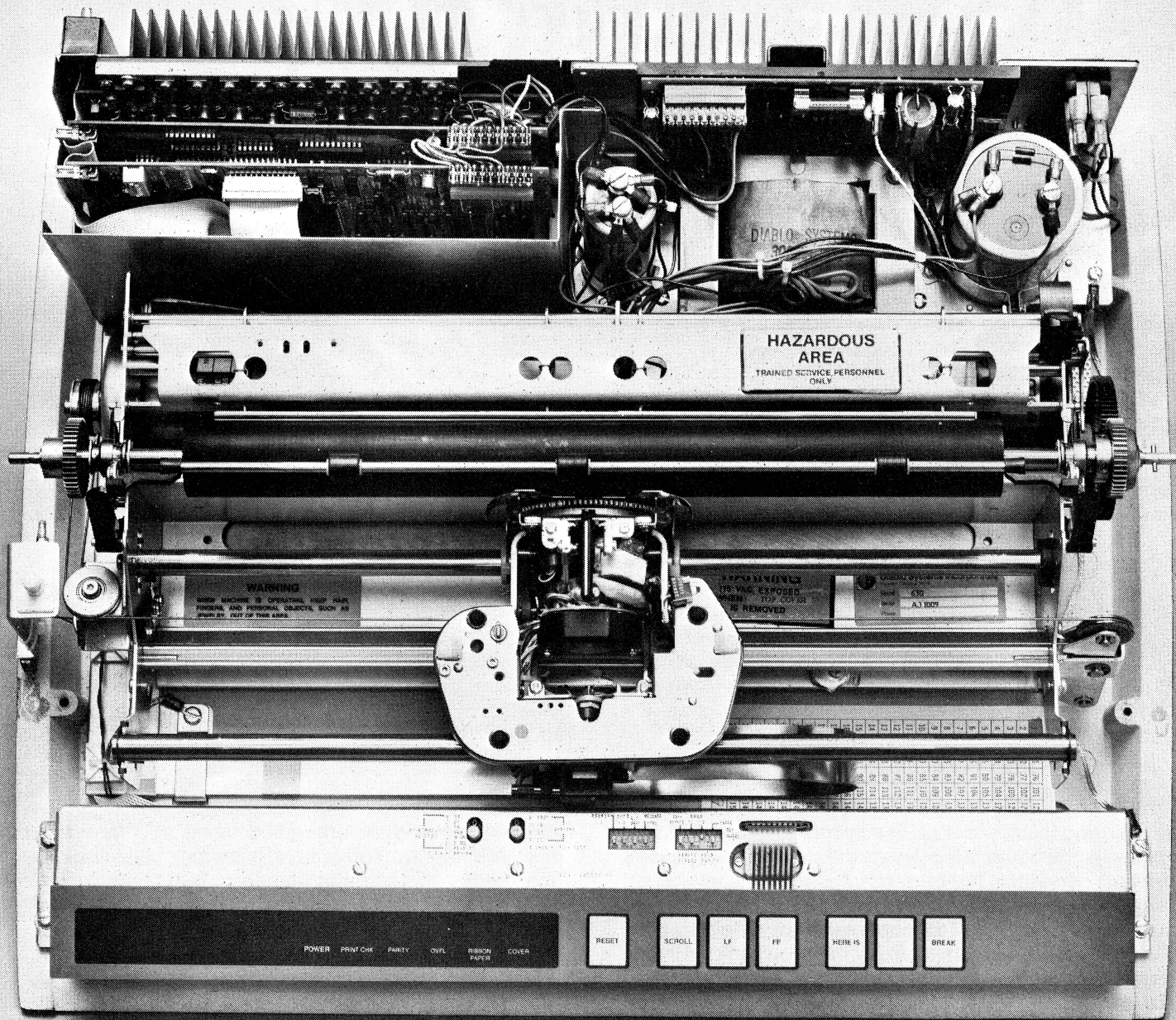
However, back to the choice of which printer to buy, if you have not already purchased one. Let me state this up front: my personal feeling is that the Diablo 1640, with keyboard, is the way to go. That's based on my analyses and prejudices; yours may be different.

The 1650 uses metal print wheels, which cost about \$40-\$60. The 1640 uses plastic wheels, which cost about \$7. Therefore for about \$50, you can have 7 different plastic wheels instead of one metal one. And, there is a far greater variety of plastic wheels and manufacturers than there is for metal wheels. If you use your printer for some very heavy duty use, be informed that the metal wheels last about five times longer; but keep in mind that metal wheels are more than five times the cost, so you may save nothing. By the way, the only 20-pitch print wheel available is plastic. More about print wheels later.

The Diablo 630 is another option. This model uses either metal or plastic wheels interchangeably. It is a more recently introduced model than the 1600 series, sells for a lower price, and while the 630 owners I know have had reasonably good results with them, there are some features available on the 1600's that don't appear on the 630. It's the old story of getting what you pay for.

First, adjustments: on the 630 you can't adjust the hammer intensity. That means, for example, that the large letter Orator 90% comes out very light on this printer. On the





1640, you have a choice of three intensities. Similarly, the paper thickness adjustment on the 630 gives you only three choices, while the 1640 gives you six.

Second, speed: the 630 is somewhat slower, at 40 characters per second (CPS) compared to the 1640 at 55 CPS. Third, it is not all that much cheaper than the 1640, as there are many more "sales" for the 1640 than for the 630.

It is possible that in the distant future the 1640 and 1650 will be discontinued, as the 630's appear to be cheaper to manufacture. So, if you want a 1640 or 1650, don't wait forever to buy one. True, the 630 can take either plastic or metal wheels, but the improvement in print quality using metal wheels rather than plastic wheels is detectable only with a magnifying glass, and even then it's difficult for me. In my opinion, the metal wheel is not worth all the extra money for 95% of applications. Again, the choice is yours.

The 630 is said to be more reliable, but many people, including myself, have trouble believing this. The 1640 and 1650 models have been the work horses of the industry for the last few years. Their ability to stay out of repair shops is almost legendary, and in my opinion, they are about as close to state of the art as you'll find right now. Maybe someone will have something better in the future, but at 55 CPS, the 1640 is in a class of its own.

Ribbons

Let's talk about ribbons for a while. There are three different types of ribbons for the Diablo: fabric, multi-strike, and single-strike. The fabric ribbon is OK for most applications, but like its typewriter counterpart, it does not give the best letter image quality. Fabric ribbons are usually woven nylon and have the longest life, but they will lighten up as you use them, and will collect dirt in the print wheels, which

necessitates frequent cleaning. They're great for drafts, but their economy may be offset by their inconvenience; who wants to keep changing ribbons back and forth for various purposes?

The second ribbon type is the multi-strike. It is made of a mylar material, and is advanced one-fourth of a character width for each letter strike. The print quality is better than the fabric ribbon, making the multi-strike ribbon best for all-around work. The ribbon travels through the cartridge only once, which has led to an increasing interest in "recycling" or reloading of the used cases with new ribbons. The recyclers have a growing market, despite the claims of some ribbon manufacturers that the reloaded cases do not work quite as effectively as new ones. The recycled ribbon is less costly, of course, so again, the choice is yours.

The third ribbon type, which is the single strike, gives the best image by far, and can be used for offset masters. These ribbons are also quite expensive to use. They strike only once, therefore you use four times as many ribbons as the multi-strike. In addition, the cost about 40% more. Each. (Ouch! —PCW.)

Keep in mind that all ribbons have a shelf life, so make sure that if you buy them in quantity, use the oldest one first.

The ribbons come in black and brown. I have heard of one manufacturer that makes multi-colored ribbons, but do not have the name, and hopefully some reader will fill me in on who makes them.

Print Wheels

I could write an entire book on print wheels, but will restrict myself to some general points. In 1981, about 10 million plastic printwheels were sold, compared to about 700,000 metal wheels. The selection of type styles available on plastic wheels is much greater than the variety of metal ones. My own collection of about 12 plastic wheels covers all of the applications that I ever could imagine. If I wanted, I could even purchase a Hebrew wheel, or almost any other language. Figure 1 is a sampler of available print wheel types.

Warning: all wheels do not have exactly the same characters, in the same places. This is because different users have different needs. Check carefully to avoid getting a "#" when you really wanted a " ".

The difference in print quality between plastic and metal wheels is very hard to detect.

Vydec, by Exxon Systems, makes a glass-reinforced plastic wheel that lasts three times longer than standard plastic wheels. As you would expect, it is about three times the cost. These give excellent print quality, and you can even get them in 15 pitch (15 characters per inch printing). AGT Computer Products manufactures a 20 pitch printwheel, but you must slow down the printer to use it because the print is so small that the wheel acts like tiny little teeth that can chew up your ribbon.

There are even some manufacturers that will custom make wheels for you. You can even take an existing wheel, send it to them, and they can put on a special character in place of one of the letters. The cost can be somewhat expensive, but for one letter it is only about \$20. (Check, for example, with Camwil Co. of Honolulu; 800-367-5675. And let us know of others. —PCW.)

As was previously mentioned, plastic wheel printers can operate at speeds up to 55 characters per second; metal wheel printers operate at about 35 CPS. The plastic wheel is also much quieter than the metal one.

You must take care to set the intensity of the printer hammer such that it is high for multiple copy printing, medium for 10 pitch wheels, and low for 12, 15 or 20 pitch wheels. If these precautions are not taken, you will have shorter than normal print wheel life. That's the reason why the ability to vary the hammer intensity is important.

When you purchase plastic printwheels, make sure that the period character has an overlay of metal. The reason for this is that with the graphics printer programs, or even lines of dots, the period is heavily used. The metal period can take a lot more of the beating it's sure to get.

The Apple Serial Card with P-8A PROM avoids the most trouble.

Setting the Printer DIP Switches

We've already covered the DIP switches in the Serial Interface card in your Apple. There are also DIP switches to be set in the printer, and the settings must correspond where required. The most important area of required correspondence is the baud rate. If you set the Serial Card switches for 1200 baud, then the printer switches must be set for 1200 baud. A less obvious example is this: if you have the parity set wrong, the Escape "E" will not work. Many strange things like this can and do happen, so be careful.

The Paper Out switch should be OFF, Speed should be 1200 baud (Switch 2 OFF and Switch 3 On), Duplex should be OFF, Switch 5 should be EVEN, with Switch 6 OFF (no parity). You can choose either 10 or 12 pitch for the next switch, depending on the wheel in use, and put Switch 8 ON for the auto carriage return. Switches 9, 10, and 11 are not normally used unless you have the options.

The Test switch is best left OFF, unless you want to test the printer. The test process causes the printer to execute a preprogrammed test sequence. When you test, make sure you have full width 14" paper in the printer, as the test prints the entire carriage width.

This is the Diablo Pica 10 wheel.
This wheel comes standard with the
Diablo printer when you purchase it.

THIS IS THE ORATOR 90% WHEEL
AND IT IS FOR TITLES AND OTHER
LARGE PRINTING SITUATIONS.

This is the Diablo Courier 10
wheel. It is a full ASCII wheel
as you will notice with the Ø.
It is excellent for listings
and such.

This is an example of the OCR-B
print face. It can be read by
many opto-scanners. It is a ten
pitch wheel.

This is the Diablo OCR-A wheel,
at a 10 pitch setting. It can be
machine-read, or used for fancy
psycho-cybernetic effects.

This is the Diablo OCR-A wheel,
at a 12 pitch setting. It can be
machine-read, or used for fancy
psycho-cybernetic effects.

THIS IS THE VYDEC NARRATOR 10
WHEEL. YOU MUST PUT THE HAMMER
INTENSITY TO THE MAXIMUM TO
ALLOW CLEAR DETAILED APPEARANCE.

This is the VYDEC Cubic 15 wheel with the HMI
set to 17, and the VMI set to 9.6. This is about as
compressed that you can go with this wheel, as
the letters are almost touching. You could even go
tighter if you wish, but it would almost be
unreadable.

This is the VYDEC Bookface Academic
10. All of the VYDEC wheels are
glass reinforced tips that last about
three times longer than standard
plastic wheels.

This is the Qume Gothic 15 wheel only
with the HMI set to 13.3 characters
per inch and the VMI set to 8 lines
per inch instead of the standard 6.

This is the Qume letter gothic 12
wheel. All of the Qume wheels will
work perfectly on the Diablo, and in
addition they have metal periods.
This is essential when doing graphics.

This is the Qume Gothic 15 wheel.
At the 12 pitch setting, it is too
wide for the print face as well as the
normal VMI.

This is an example of the print face of
prestige elite 12 of the VYDEC line of
print wheels.

Figure 1

APPLE CP/M

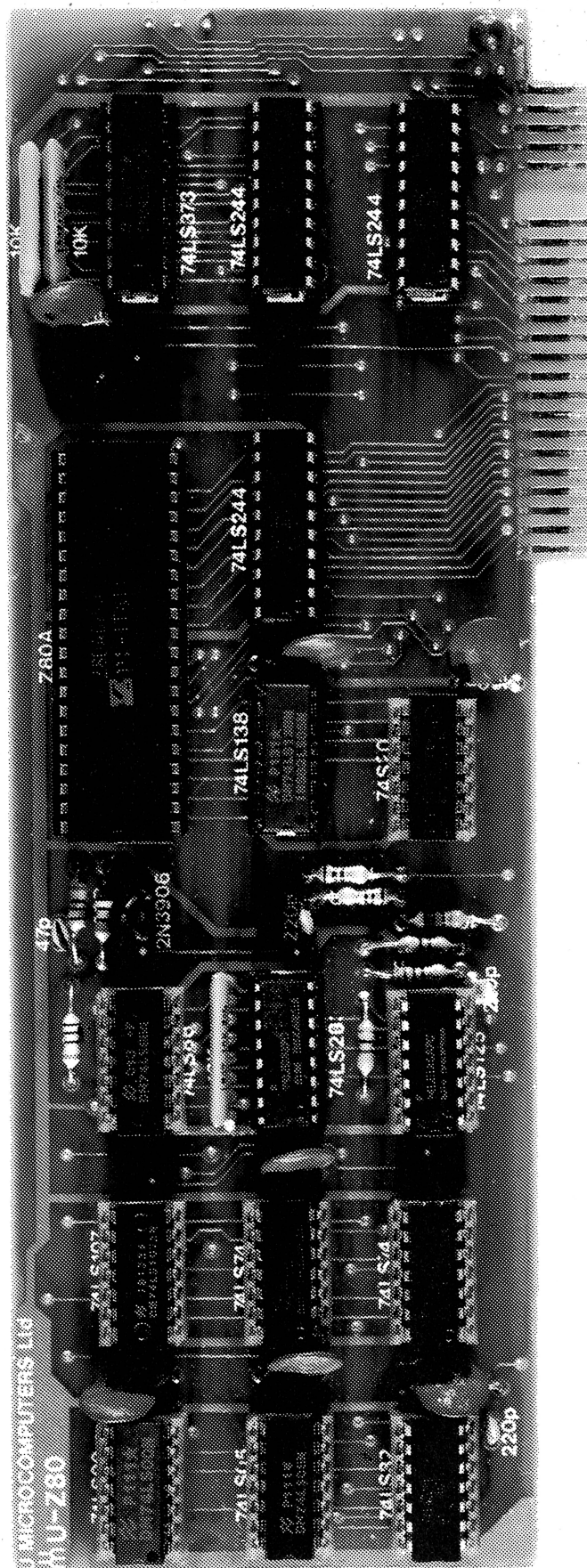
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Vertical and Horizontal Motion Indexes

One of the most powerful features of the Diablo is your ability to set the vertical and horizontal motion indexes; this gives close and flexible control of the expansion or condensation of the print, both vertically and horizontally. This is excellent for graphics, text, or whatever. Legal contracts using a 15 pitch wheel, for example, may use a horizontal motion index (HMI) of about 15 per inch, while a large type face such as Orator 90% may use 8 per inch. The VMI should also be adjusted to in the same manner to compensate for these differences.

A powerful feature is close control of vertical and horizontal pitch.

These adjustments can easily be made from the Diablo keyboard, or under software control (or the Apple keyboard). With the Diablo keyboard, to adjust the HMI type <ESCAPE>, Ctrl -, and the code for the desired value. ('Ctrl' is called "US," and is ASCII 31). For example, to print at 15 pitch (15 characters per inch, horizontally), enter <ESCAPE>, Ctrl -, and Ctrl I. The Diablo will then type at that setting.

The vertical adjustment is only slightly different; the operative control code is called "RS," with an ASCII value of 30. We access it with 'Ctrl .' So, to compress the vertical to 8 lines per inch from the normal 6, type <ESCAPE>, Ctrl =, Ctrl G. Now type anything on the Diablo keyboard and watch how small the motion is, including line feeds.

To do the same thing from the Apple, we use the ASCII codes in the print routines of our programs. For example, in Applesoft we can do the same thing we just did above, this way:

```
10 PRINT CHR$(27) CHR$(31) CHR$(9)
20 PRINT CHR$(27) CHR$(30) CHR$(7)
```

The 27 is the ASCII code for <ESCAPE>, the 31 is the '"', the 30 is the '=' the 9 applies to 15 HMI, and the 7 applies to 8 VMI. Make sure you put all three of the characters required for a command on one line or the printer will not accept the <ESCAPE> after a carriage return.

Figure 2 is a list of the CHR\$ values, the keyboard command, the HMI, and the VMI. In addition, for the specialists we have some additional modes that are controlled by the ESCAPE functions:

ESC 0 - set right margin ESC 1 - set horizontal tab ESC 2 - clear all tabs ESC 3 - turn on graphics mode ESC 4 - turn off graphics mode ESC 5 - print forward ESC 6 - print backward ESC 8 - clear individual tab ESC 9 - set left margin ESC A - print in red (with proper ribbon) ESC B - print in black (default) ESC D - negative half line feed ESC U - positive half line feed ESC CTRL I (n) - absolute horizontal tab ESC CTRL J - negative line feed ESC CTRL K (n) - absolute vertical tab ESC CTRL (n) - set VMI ESC CTRL (n) - set HMI.

Diablo Printer HMI/VMI Chart

CHR\$(n)	Keyboard Control	Vertical Pitch (lines/in)	Horiz. Pitch (cols/in)
0	Ctrl 'I'	--	--
1	Ctrl 'A'	--	--
2	Ctrl 'B'	48	120
3	Ctrl 'C'	24	60
4	Ctrl 'D'	16	40
5	Ctrl 'E'	12	30
6	Ctrl 'F'	9.6	24
7	Ctrl 'G'	8	20
8	Ctrl 'H'	7	17
9	Ctrl 'I'	6	15
10	Ctrl 'J'	5.3	13.3
11	Ctrl 'K'	4.8	12
12	Ctrl 'L'	4.4	11
13	Ctrl 'M'	4	10
14	Ctrl 'N'	3.7	9.25
15	Ctrl 'O'	3.4	8.5
16	Ctrl 'P'	3.2	8
17	Ctrl 'Q'	3	7.5
18	Ctrl 'R'	2.8	7
19	Ctrl 'S'	2.7	6.7
20	Ctrl 'T'	2.5	6.3
21	Ctrl 'U'	2.4	6
22	Ctrl 'V'	2.3	5.75
23	Ctrl 'W'	2.2	5.5
24	Ctrl 'X'	2.1	5.25
25	Ctrl 'Y'	2	5
26	Ctrl 'Z'	1.9	4.75
27	ESC	1.85	4.6
28	Ctrl ' '	1.78	4.44
29	Ctrl ' ''	1.71	4.3
30	Ctrl ' ='	1.66	4.14
31	Ctrl ' -'	1.6	4
32	SPACE	1.55	3.87
33	!	1.5	3.75
34	"	1.45	3.64
35	#	1.41	3.53
36	\$	1.37	3.45
37	%	1.33	3.33
38	&	1.30	3.24
39	'	1.26	3.16
40	(1.23	3.08
41)	1.20	3.00
42	*	1.17	2.93
43	+	1.14	2.86
44	,	1.12	2.79
45	-	1.09	2.73
46	.	1.06	2.67
47	/	1.04	2.61
48	0	1.02	2.50
49	1	1.00	2.50

(Prestige Elite, 12 Pitch)

Figure 2

Introducing the hands-on chess
peripheral for your Apple II . . .

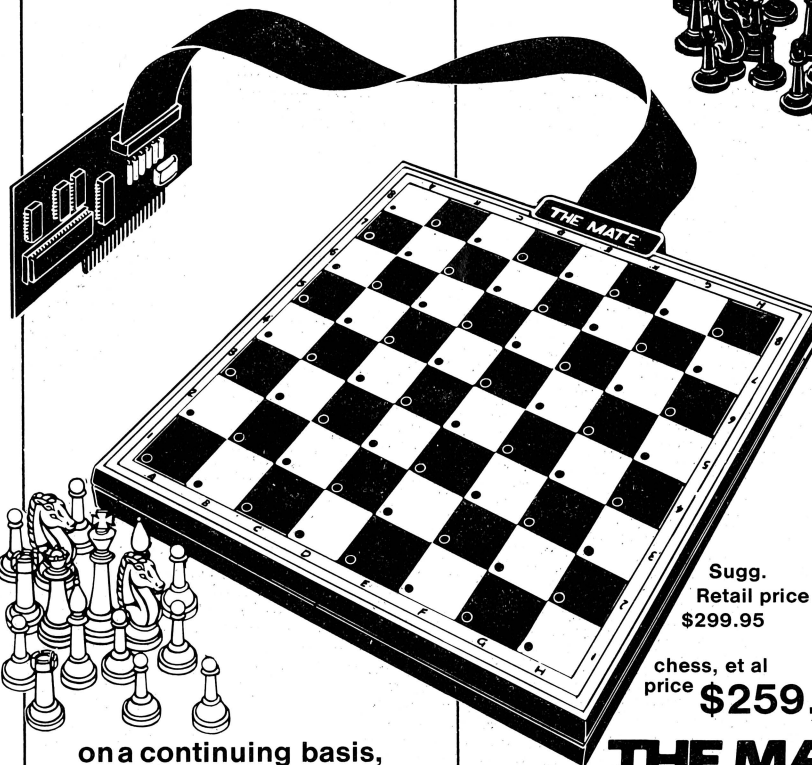
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Neil Lipson has both degrees in Electrical Engineering and an MBA from Drexel University in Philadelphia, PA. He is a Registered Professional Engineer in Pennsylvania, and works as a micro-computer consultant in the Philadelphia area. Neil was the founding vice-president of the IAC, and is the present Software Chairman. He started the Philadelphia Apple Club in 1978, and is still its President. He developed the Lipson Light Pen for the Apple in 1978, and has written software for both Powersoft and Progressive Software in areas of finance and engineering.

Special Interest Points

There are a few other things about the Diablo printer that should be mentioned. If you want to use it with another computer, as for example an Apple /// or a Commodore 8032, you must first correct one of the wires on the HPRO4 board inside the unit to insure proper handshaking. The Apple II will work properly with or without this modification, but those of you with two computers may want to make this change.

Follow the maintenance schedule closely according to the manual to insure long term operation. The printer is known for long term operation with a minimum of breakdowns, and most of the people I know (including myself) have never had a repair, unless they spilled a milkshake down inside the machine. Lightly oil the "rail" periodically for smooth print operation, as the manual recommends. Always keep the unit covered when not in use, and provide good air circulation for cooling when it is in use. If you plan to buy a tractor feed, as 95% of us do, pay a little extra and get the bi-directional unit. It makes life a lot easier both for normal use, and if you want to do something fancy like reverse printing.

You could operate the unit with the cover off if you pull up the cover switch, but watch out for fingers, or hair getting in the works. Never touch the print wheel while the unit is on. It tries to put it in the proper sequence, and the slightest touch will cause it to jump. This includes the wheel-ribbon assembly. By the way, the entire wheel-ribbon assembly moves easily right or left only when the power is off, to change ribbons, wheels, etc.

And last but not least, I have included two HI-RES dumps using the Graphics Printing System by Paul Mosher M. D., of myself and Donald Duck (I'll let you guess which one is me). As we have seen, this printer can do just about anything, and the applications are limited only by your imagination.

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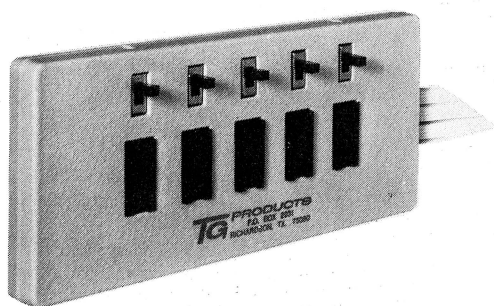


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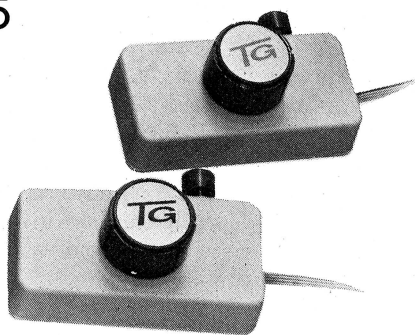


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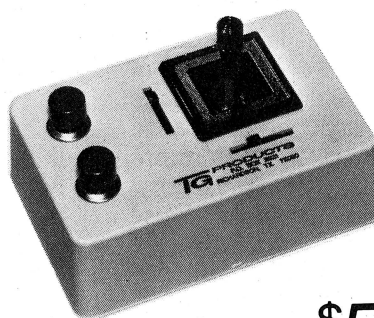
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FILE CABINET STUFFER AND FILE CABINET FILE INITIALIZER

by Mike Kramer
Houston Area Apple Users' Group

It is generally agreed that data storage and retrieval is one of the most popular uses of the personal computer. The validity of this statement is evidenced by the abundance of commercially-available software such as DB Master, Data Factory, Information Master, and PFS. These software packages offer a lot of power and capability, but they often require use of two disk drives for efficient use and are possibly too expensive for personal use. With a few exceptions, the files can only be accessed by the programs that created them and cannot be used by user application programs.

Most Apple users are probably familiar with one of the oldest data base systems available for the Apple II...APPLE FILE CABINET. Although somewhat limited in capability when compared to the commercial data base programs, FILE CABINET provides a means of interactively defining data files, entering data, sorting, retrieving records containing specific data, deleting records, and printing reports. One of the best features of FILE CABINET is its price. It's available free of cost

from your friendly Apple dealer as part of Volume 3 of the Apple Contributed Library. It's probably available from most users' group libraries (there are at least seven versions in the H.A.A.U.G. library, each a little better than the previous one). Perhaps the best thing about FILE CABINET is that the structure of the data files created by FILE CABINET is known and the files can be easily used by application programs. If FILE CABINET or the programs described below are used for setting up and maintaining files, those programs need not be burdened by involved data entry code.

Although FILE CABINET provides many good capabilities, it is lacking in ease of use when the same data item or items are to be entered in consecutive records. This became apparent when FILE CABINET was first used to set up grade files for use with the grade reporting package I wrote for my Biology Teacher wife. It was quickly discovered that entry of a grade in each student's record required retrieval of his record by record number and entry of his test

or daily work grade. With 150 students, this promised to become a real chore. Since I anticipated having to enter the grades myself, FILE CABINET STUFFER was developed to provide a means to enter one or more data items common to consecutive records in FILE CABINET files without having to call out those records.

The second problem area was discovered when setting up grade files (you guessed it...for the same Biology Teacher wife). It seems that FILE CABINET requires that something be entered into every item of every record in a file. Given the fact that three files containing 20 items per record were to be created each six weeks for each of five classes averaging 30 students, I figured quickly that I did not have the time to enter 9000 <RETURNS> every time new files were set up. This time the answer was FILE CABINET FILE INITIALIZER, a program designed to create FILE CABINET files and pre-initialize each data item with specified character, such as a blank or asterisk.

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FILE CABINET STUFFER

When FILE CABINET STUFFER is run it first asks the user to insert the disk containing FILE CABINET FILES and press <RETURN>. If they are not found, he is asked to insert the correct disk and try again. When FILE CABINET files are found, the BASENAMEFILE is read and a list of data bases is displayed on the screen. The user selects the desired data base and the HEADERFILE, containing the data item names, and the INDEXFILE containing the actual data are read into memory. A list of data header names is then displayed and the user is asked to specify whether he wants to be prompted by record number or by the contents of a particular header, such as "NAME". He is then asked to indicate how many items common to each record are to be displayed and which ones they are. If an "A" or "ALL" is entered in response to the "how many" question, it is not necessary to indicate which items. As soon as the options have been entered, the prompt item for the first specified record is displayed along with the current value of the first specified data item in that record. The user can then enter a new value, press <RETURN> if no change is to be made, or press <CTRL E> to erase the current value. If an <*> is entered or the last record has been processed, the user can optionally update the disk files, make more changes to the same data base, access a different data base, or end.

FILE CABINET FILE INITIALIZER

When FILE CABINET FILE INITIALIZER is run, it asks for the new file name, the number of records, and the character to be entered into every item of every record in the file. It also asks the user to enter the data headers (or data types) to be included in the file. A check is made to see if there are FILE CABINET files on the disk. If the selected file name already exists, an opportunity is given to change the name before the old file of the same name is overwritten. When the necessary information has been entered, FILE CABINET FILE INITIALIZER creates FILE CABINET files if they do not exist or adds to existing ones if they do. The monitor is turned on to permit observation of the creation process and then turned off when execution is terminated.

The user can then use FILE CABINET or FILE CABINET STUFFER to enter data whenever he wants. It is advisable to try FILE CABINET FILE INITIALIZER on a duplicate disk until proper operation is verified.

ERROR HANDLING

Proper operation of both FILE CABINET STUFFER and FILE CABINET FILE INITIALIZER depends on use of the ONERR command provided in Applesoft Basic. FILE CABINET in its various versions uses ONERR to determine whether files exist. It fails, however, to continue handling errors through the rest of its execution. This was discovered when a file had not actually been updated after a lengthy session because the disk was write-protected!

FILE CABINET STUFFER and FILE CABINET FILE INITIALIZER both contain error handling routines based on a technique presented in the September 1980 issue of CALL-A.P.P.L.E. This technique permits selective handling of certain errors and optional recovery or termination with full access to system error messages contained in the monitor and in DOS. Try opening the door to the disk drive just before telling FILE CABINET STUFFER to update the disk, or write protect the disk before attempting to update it. With a little study you should be able to incorporate the technique in your programs. Maybe someone will add it to FILE CABINET!!

FILE CABINET FILE STRUCTURE

For those of you interested in using FILE CABINET files in your programs, the file structures are summarized below. FILE CABINET uses sequential data files, which results in limited data base capacities, since the whole file must be held in main memory. Having the whole file in memory does result in rapid retrieval of information. The number of data bases contained and their names are stored in the BASENAMEFILE as shown in Figure 1. The BASENAMEFILE is normally read into memory and either displayed in a menu as done in FILE CABINET STUFFER or searched by an application program for a specific file. If the desired base name is found, the string "HEADERFILE" is appended to the data base name to obtain the name of the file containing the headers, or data item

names. The header file is read in to determine how many headers there are in each record and the header names. The structure of the header file is detailed in Figure 2. The string "INDEXFILE" is then appended to the data base name to obtain the name of the index or data file. The first thing read from the index file is the number of "records". The index file is usually read into memory using a pair of nested loops, where the range of the outer loop is equal to the number of headers and the range of the inner loop is equal to the number of records in the data base. Figure 3 shows the index file structure. Examples of how to read these files can be found in both FILE CABINET STUFFER and FILE CABINET FILE INITIALIZER.

RECORD 0	NO. OF DATA BASES ON FILE
RECORD 1	NAME OF FIRST DATA BASE
RECORD 2	NAME OF SECOND DATA BASE
	*
	*
RECORD N	NAME OF LAST DATA BASE

Figure 1.
BASENAMEFILE Format

RECORD 0	NO. OF HEADERS IN DATA STRUCTURE
RECORD 1	FIRST HEADER
RECORD 2	SECOND HEADER
	*
	*
RECORD N	LAST HEADER

Figure 2.
HEADERFILE Format

Although an explanation of FILE CABINET is beyond the scope of this article, the file structures detailed above should be useful to those who wish to understand FILE CABINET STUFFER, FILE CABINET FILE INITIALIZER, and FILE CABINET itself. A good tutorial of the original version of FILE CABINET can be found in the April 1980 issue of *Interface Age* in the article "Data Base Management for the Apple II" by Phil Roybal of Apple Computer. Instructions for using FILE CABINET can be found in the Apple Software Bank Contributed Programs Volume 3.

RECORD 0	NO. OF RECORDS IN THIS DATA BASE
RECORD 1	FIRST ENTRY OF FIRST RECORD
RECORD 2	SECOND ENTRY OF FIRST RECORD
	*
	*
RECORD M	LAST ENTRY OF FIRST RECORD
RECORD M+1	FIRST ENTRY OF SECOND RECORD
RECORD M+2	SECOND ENTRY OF SECOND RECORD
	*
	*
RECORD N	LAST ENTRY OF LAST RECORD

Figure 3.
INDEXFILE Format

```

10 REM *****
11 REM *
12 REM * FC FILE INITIALIZER *
13 REM * WRITTEN BY *
14 REM * MIKE KRAMER *
15 REM * HOUSTON AREA *
16 REM * APPLE USERS GROUP *
17 REM * MARCH 1982 *
18 REM *
19 REM *****

20 HOME = VTAB 5
30 PRINT "*****"
   PRINT "*****";
40 PRINT
50 PRINT TAB( 6)"FILE CABINET F
   ILE INITIALIZER"
60 PRINT
70 PRINT TAB( 15)"WRITTEN BY"
80 PRINT
90 PRINT TAB( 14)"MIKE KRAMER"
100 PRINT
110 PRINT TAB( 6)"HOUSTON AREA
   APPLE USERS GROUP"
120 PRINT
130 PRINT TAB( 15)"MARCH 1982"
140 PRINT
150 PRINT "*****"
   PRINT "*****";
160 VTAB 20: HTAB 13: PRINT "INS
   TRUCTIONS? "; GET A$: PRINT
   : IF A$ < > "Y" AND A$ < >
   "N" THEN 160
170 IF A$ = "Y" GOTO 970

```

```

180 GOSUB 870
190 HOME = CLEAR
200 VTAB 12: PRINT "INSERT FILE
   CABINET DISK - PRESS A KEY";
   : GET A$: PRINT : HOME
210 D$ = CHR$(13) + CHR$(4):O
   P$ = D$ + "OPEN":WR$ = D$ +
   "WRITE":RD$ = D$ + "READ":CL
   $ = D$ + "CLOSE":DL$ = D$ +
   "DELETE": REM CHR$(13) IN D
   $ PERMITS MULTIPLE DISK COMM
   ANDS IN A PRINT STATEMENT
220 BN$ = "BASENAMEFILE":HD$ = "
   HEADERFILE":IX$ = " INDEXFIL
   E"
230 DIM HD$(20),BN$(40)
240 ONERR GOTO 810
250 REM

```

READ BASENAME FILE

```

260 PRINT OP$BN$RD$BN$
270 INPUT NB$:NB = VAL (NB$)
280 FOR N = 1 TO NB: INPUT BN$(N
   ): NEXT N
290 PRINT CL$
300 ONERR GOTO 830
310 PRINT : INPUT "NAME OF NEW D
   ATA BASE? ";DB$: IF LEN (DB
   $) = 0 THEN HOME : GOTO 780

```

320 REM

CHECK FOR VALID BASENAME

```

330 IF ASC ( LEFT$ (DB$,1)) < 6
   5 OR ASC ( LEFT$ (DB$,1)) >
   91 THEN PRINT : PRINT "NAME
   MUST START WITH A LETTER.":
   GOTO 310
340 IF LEN (DB$) > 19 THEN PRINT
   : PRINT "NAME MUST HAVE LESS
   THAN 20 CHARACTERS": GOTO 3
   10
350 FOR J = 1 TO NB
360 IF DB$ = BN$(J) GOTO 390
370 NEXT J
380 NB = NB + 1:NB$ = STR$ (NB):
   BN$(NB) = DB$: GOTO 440
390 PRINT : PRINT DB$;" ALREADY
   EXISTS.": PRINT : INPUT "REP
   LACE EXISTING FILE? ";A$:A$ =
   LEFT$ (A$,1): IF A$ < > "Y
   " AND A$ < > "N" GOTO 390
400 IF A$ = "N" GOTO 310
410 PRINT OP$DB$HD$DL$DB$HD$
420 PRINT OP$DB$IX$DL$DB$IX$
430 REM

```

INPUT FILE INFO

```

440 PRINT : INPUT "NUMBER OF REC
   ORDS? ";NR$:NR = VAL (NR$):
   IF NR < 1 GOTO 440
450 PRINT : PRINT "CHARACTERS TO
   WRITE TO EACH ENTRY.": PRINT
   : INPUT "":ST$
460 NH = 0
470 PRINT : PRINT "ENTER HEADER
   # ";NH + 1;": ": INPUT "":H
   $: IF LEN (H$) < > 0 THEN
   NH = NH + 1:HD$(NH) = H$: GOTO
   470
480 IF NH = 0 GOTO 470

```



```

490 PRINT D$"MONCIO"
500 REM

```

CREATE HEADER FILE

```

510 PRINT OP$DB$HD$DL$DB$HD$
520 PRINT OP$DB$HD$WR$DB$HD$
530 PRINT NH
540 FOR N = 1 TO NH
550 PRINT HD$(N)
560 NEXT N
570 PRINT CL$
580 REM

```

CREATE DATA FILE

```

590 PRINT OP$DB$IX$DL$DB$IX$
600 PRINT OP$DB$IX$WR$DB$IX$
610 PRINT NR
620 FOR M = 1 TO NR
630 FOR N = 1 TO NH
640 PRINT ST$
650 NEXT N
660 NEXT M
670 REM

```

WRITE BASENAME FILE

```

680 PRINT CL$
690 PRINT OP$BN$WR$BN$
700 PRINT NB
710 FOR N = 1 TO NB
720 PRINT BN$(N)
730 NEXT N
740 PRINT CL$
750 PRINT : INPUT "INITIALIZE MO
RE FILES? ";A$:A$ = LEFT$ (
A$,1): IF A$ < > "Y" AND A$
< > "N" GOTO 750
760 IF A$ = "N" THEN HOME : GOTO
780
770 GOTO 190
780 PRINT D$"NOMONCIO"
790 HOME : END
800 REM

```

ERROR HANDLING

```

810 CALL 1013:I = PEEK (222): IF
I = 5 OR I = 6 THEN HOME : GOTO
300 REM NO BASENAMEFILE .
. LET ONE BE CREATED
820 GOTO 840
830 CALL 1013
840 HOME : VTAB 12: GOSUB 920: IF
I > 3 AND I < 10 THEN PRINT
: PRINT "CORRECT ERROR, THEN
PRESS A KEY:";: GET A$: PRINT
: RESUME
850 PRINT "FATAL ERROR IN LINE "
: PEEK (218) + 256 * PEEK (
219): VTAB 23: END
860 REM

```

AS ONERR CORRECTION

```

870 FOR I = 1013 TO 1022: READ P
P: POKE I,PP: NEXT I
880 I = 0
890 RETURN
900 DATA 104,168,104,166,223,1
54,72,152,72,96
910 REM

```

ERROR MSG PRINTING

```

920 MSG$ = CHR$ (0):I = PEEK (2
22): IF I = 0 OR I > 15 THEN
J = 53856 + I + (I = 255) *
- 1: GOTO 940
930 J = 43377 + PEEK (43583 + I)
940 K = PEEK (J):MSG$ = MSG$ + CHR$
(K): IF K < 192 THEN J = J +
1: GOTO 940
950 PRINT MSG$: PRINT : RETURN
960 REM

```

INSTRUCTIONS

```

970 HOME : PRINT
980 PRINT ">>> FILE CABINET
INITIALIZER <<<"
990 PRINT
1000 PRINT "THIS PROGRAM SETS UP
FILE CABINET FILES"
1010 PRINT "WITH A SPECIFIED NUM
BER OF RECORDS. THE"
1020 PRINT "PROGRAM RUNS WITH TH
E DISK COMMAND"
1030 PRINT "MONITOR ON TO PERMIT
DISK ACTIVITY TO"
1040 PRINT "BE WATCHED."
1050 PRINT
1060 PRINT "YOU WILL BE ASKED FO
R THE NEW DATA BASE"
1070 PRINT "NAME, THE NUMBER OF
RECORDS, AND THE"
1080 PRINT "HEADERS TO BE USED.
IF THE DATA BASE"
1090 PRINT "NAMED EXISTS, YOU WI
LL BE PERMITTED TO"
1100 PRINT "ENTER ANOTHER NAME I
F YOU DESIRE. WHEN"
1110 PRINT "THE HEADERS HAVE BEE
N ENTERED, PRESS"
1120 PRINT "<RETURN> TO INDICATE
THERE ARE NO MORE."
1130 PRINT "YOUR NEW EMPTY FILE
CABINET WILL BE"
1140 PRINT "CREATED BEFORE YOUR
EYES."
1150 PRINT
1160 PRINT
1170 VTAB 22: PRINT "PRESS <RETU
RN> TO CONTINUE,<ESC> TO EXI
T";: GET A$: PRINT
1180 IF A$ = CHR$ (13) THEN 180
1190 IF A$ = CHR$ (27) THEN HOME
: END
1200 GOTO 1170
1210 END

```

```

10 REM *****
11 REM *
12 REM * FILE CABINET STUFFER *
13 REM * WRITTEN BY *
14 REM * MIKE KRAMER *
15 REM * HOUSTON AREA *
16 REM * APPLE USERS GROUP *
17 REM * MARCH 1982 *
18 REM *
19 REM *****

```


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CITY/STATE/ZIP _____ AGE _____ SEX _____ Circle: SINGLE MARRIED # CHILDREN _____

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XEROX DEC TEXAS INST. NORTH STAR COMMODORE VECTOR CROMEMCO OTHER OWNED HOW LONG
DISK DRIVES _____ OWN HARD DISK? _____ OWN MODEM? _____ PRINTER BRAND _____ MONITOR BRAND _____

APPROX. # DISKETTES OWNED _____ BRAND PREFERENCE _____ OPERATING SYSTEM(S) _____

AMOUNT OF MEMORY (Circle) 8K 16K 24K 32K 48K 64K 128K MORE # DISKETTES PURCHASED/YEAR _____

LANGUAGES YOU PROGRAM WITH OR USE (Circle) BASIC FORTRAN COBOL MACHINE ASSEMBLER MONITORS
FORTH ALGOL PASCAL C ADA APL LISP CAI DO YOU WRITE YOUR OWN SOFTWARE (Circle) YES NO

APPROXIMATE NUMBER OF SOFTWARE PROGRAMS YOU OWN PER CATEGORY:

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YOUR PROFESSION _____ PRIMARY USE FOR YOUR COMPUTER _____

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COLLEGE GRADUATE SOME GRADUATE SCHOOL MASTER'S DEGREE OTHER _____

WHICH PUBLICATIONS DO YOU SUBSCRIBE TO OR READ REGULARLY (Circle all that apply) APPLE ORCHARD BYTE CALL-APPLE
COMPUTE COMPUTERWORLD CREATIVE COMPUTING DESKTOP COMPUTING INTERFACE AGE INFOWORLD
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```

20 D$ = CHR$(13) + CHR$(4):OP
   $ = D$ + "OPEN":CL$ = D$ + "
   CLOSE":RD$ = D$ + "READ":WR$
   = D$ + "WRITE"
30 HD$ = "HEADERFILE":IX$ = " IN
   DEXFILE":BN$ = "BASENAMEFILE
   "
40 MEM = FRE (0): IF MEM < 0 THEN
   MEM = 65536 + MEM
50 RC = INT (MEM / 110)
60 DIM DB$(30),IP$(RC,21),H$(21)
   ,IT(21)
70 GOSUB 1110
80 GOSUB 1480
90 VTAB 21: PRINT TAB(13)"INST
   RUCTIONS? ";; GET A$: PRINT
   : IF A$ = "Y" THEN GOSUB 12
   10
100 IF A$ < > "N" THEN 90
110 VTAB 21: CALL - 958: PRINT
   "INSERT FILE DISK AND PRESS
   ANY KEY: ";
120 GET A$: PRINT
130 REM

```

READ BASENAME FILE

```

140 ONERR GOTO 1060
150 PRINT OP$BN$RD$BN$
160 INPUT ND$:ND = VAL (ND$)
170 FOR N = 1 TO ND
180 INPUT DB$(N)
190 NEXT N
200 PRINT CL$
210 ONERR GOTO 1080
220 REM

```

LIST DATA BASES

```

230 TI$ = "FILE CABINET DATA CHAN
   GE"
240 HOME : PRINT : PRINT TAB(2
   0 - LEN (TI$) / 2)TI$: PRINT
250 PRINT "SELECT A DATABASE:"
260 FOR N = 1 TO ND
270 PRINT TAB(5)"( ";N; " ) ";DB$
   (N)
280 NEXT N
290 REM

```

PICK DATA BASE

```

300 PRINT : PRINT : INPUT "ENTER
   NUMBER OR '/' TO END: ";NU$
   :NU = VAL (NU$)
310 IF LEFT$(NU$,1) = "/" THEN
   1040
320 IF NU < 1 OR NU > ND THEN 30
   0
330 REM

```

READ HEADER FILE

```

340 PRINT OP$DB$(NU)HD$
350 PRINT RD$DB$(NU)HD$
360 INPUT NH$:NH = VAL (NH$)
370 FOR N = 1 TO NH
380 INPUT H$(N)
390 NEXT N
400 PRINT CL$
410 POKE 34,0: HOME : VTAB 12: PRINT
   "READING "DB$(NU)" DATA"
420 REM

```

READ DATA FILE

```

430 PRINT OP$DB$(NU)IX$
440 PRINT RD$DB$(NU)IX$
450 INPUT NR$:NR = VAL (NR$)
460 FOR M = 1 TO NR
470 FOR N = 1 TO NH
480 INPUT IP$(M,N)
490 NEXT N
500 NEXT M
510 PRINT CL$
520 REM

```

PICK ITEM TO CHANGE

```

530 HOME : VTAB 2: PRINT DB$(NU)
   ;" DATA HEADERS:"
540 PRINT TAB(5)"(0) RECORD #"
550 FOR N = 1 TO NH
560 PRINT TAB(5)"( ";N; " ) ";H$(
   N)
570 NEXT N
580 POKE 34,NH + 2
590 INPUT "LIST BY ITEM NUMBER:
   ";IT$:IT = VAL (IT$): IF IT
   < 0 OR IT > NH THEN 590
600 PRINT : INPUT "HOW MANY ITEM
   S TO CHANGE? ";NI$:NI = VAL
   (NI$)
610 IF LEFT$(NI$,1) = "A" OR N
   I = NH THEN NI = NH: FOR N =
   1 TO NH:IT(N) = N: NEXT N: GOTO
   670
620 IF NI < 1 OR NI > NH THEN 60
   0
630 FOR N = 1 TO NI
640 PRINT : PRINT "NUMBER OF ITE
   M ";N;: INPUT ": ";IT$:IT(N)
   = VAL (IT$): IF IT(N) < 1 OR
   IT(N) > NH THEN PRINT : PRINT
   "INVALID NUMBER.": GOTO 640
650 NEXT N
660 REM

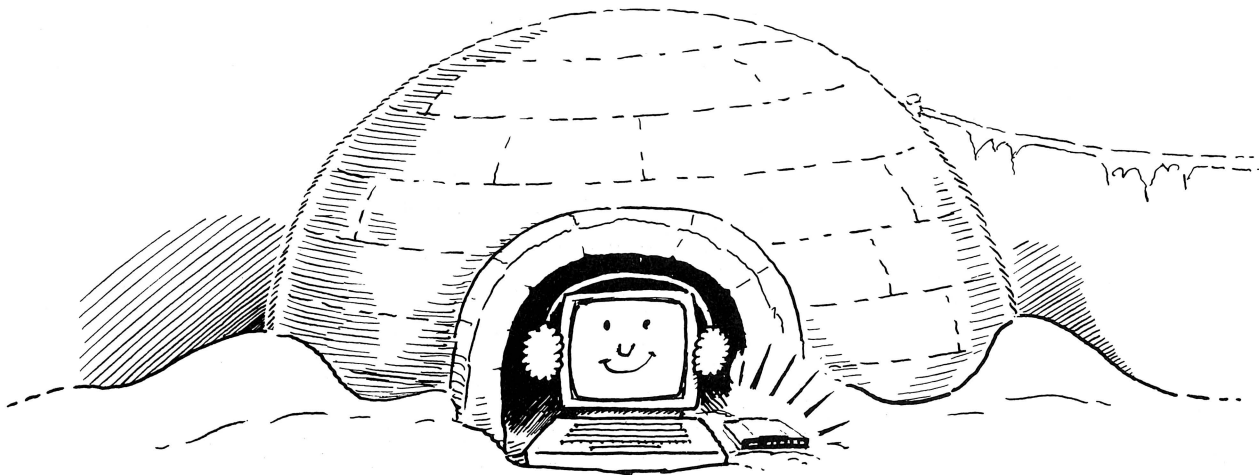
```

ENTER OR CHANGE DATA

```

670 POKE 34,0: HOME : PRINT TAB(
   20 - LEN (DB$(NU)) / 2)DB$(
   NU): PRINT
680 PRINT "<RET> FOR NO CHANGE,<
   CTRL A>TO ABORT <CTRL
   E> TO ERASE OLD ENTRY": POKE
   34,5
690 FOR M = 1 TO NR
700 PRINT : PRINT "REC #";M
710 IF IT = 0 THEN 730
720 PRINT : PRINT "ITEM #";IT;"
   = ";IP$(M,IT)
730 FOR K = 1 TO NI
740 PRINT H$(IT(K));" = ";IP$(M,
   IT(K))
750 INPUT "CHANGE TO: ";CH$
760 IF LEFT$(CH$,1) = CHR$(1
   ) GOTO 820
770 IF LEN (CH$) = 0 THEN PRINT
   : PRINT "NO CHANGE MADE.": PRINT
   : GOTO 800
780 IF CH$ = CHR$(5) THEN IP$(
   M,IT(K)) = "": PRINT : PRINT
   "ENTRY ERASED": PRINT : GOTO
   800
790 IF IP$(M,IT(K)) = CH$: PRINT : PRINT
   "CHANGED TO ";IP$(M,IT(K)): PRINT

```

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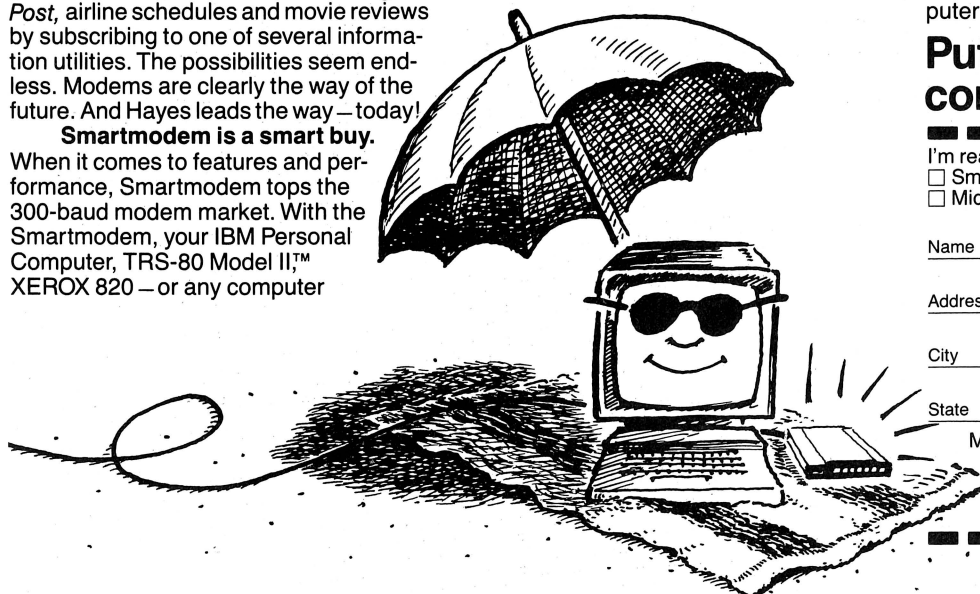
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5835 Peachtree Corners East
Norcross, Georgia 30092
OR CALL: (404) 449-8791




```

800 NEXT K
810 NEXT M
820 PRINT : INPUT "UPDATE DISK F
    ILE? ";YN$: POKE 34,0
830 IF LEFT$(YN$,1) = "Y" THEN
    860
840 IF LEFT$(YN$,1) = "N" THEN
    970
850 GOTO 820
860 POKE 34,0
870 REM

```

UPDATE FILES

```

880 PRINT OP$DB$(NU)IX$
890 PRINT RD$DB$(NU)IX$
900 PRINT NR$
910 FOR M = 1 TO NR
920 FOR N = 1 TO NH
930 PRINT IP$(M,N)
940 NEXT N
950 NEXT M
960 PRINT CL$
970 PRINT : INPUT "MORE CHANGES?
    ";A$:A$ = LEFT$(A$,1)
980 IF LEFT$(A$,1) = "N" THEN
    1040
990 IF A$ < > "Y" THEN 970
1000 PRINT : INPUT "USE SAME FIL
    ES? ";A$:A$ = LEFT$(A$,1)
1010 IF A$ = "N" THEN 230
1020 IF A$ = "Y" THEN 530
1030 GOTO 1000
1040 POKE 34,0: HOME : END
1050 REM

```

ERROR HANDLING

```

1060 CALL 1013:I = PEEK (222): IF
    I = 5 OR I = 6 THEN VTAB 18
    : PRINT CHR$(7)"FILE CABIN
    ET FILES NOT ON THIS DISKETT
    E.": GOTO 110
1070 GOTO 1090
1080 CALL 1013
1090 HOME : VTAB 12: GOSUB 1150:
    IF I > 3 AND I < 10 THEN PRINT
    TAB(3)"CORRECT ERROR, THEN
    PRESS A KEY.": GET A$: PRINT
    : RESUME
1100 PRINT TAB(7)"FATAL ERROR
    IN LINE ";PEEK (218) + 256 *
    PEEK (219): VTAB 23: END
1110 FOR I = 1013 TO 1022: READ
    PP: POKE I,PP: NEXT I
1120 I = 0
1130 RETURN
1140 DATA 104,168,104,166,223,1
    54,72,152,72,96
1150 MSG$ = CHR$(0):I = PEEK (
    222): IF I = 0 OR I > 15 THEN
    J = 53856 + I + (I = 255) *
    - 1: GOTO 1170
1160 J = 43377 + PEEK (43583 + I
    )
1170 K = PEEK (J):MSG$ = MSG$ +
    CHR$(K): IF K < 192 THEN J
    = J + 1: GOTO 1170
1180 PRINT TAB(20 - LEN ("**
    " + MSG$ + " **")) / 2)"** ";
    MSG$;" **": PRINT : RETURN
1190 REM ERROR MESSAGE PRINTING
    (CALL APPLE 9/80)
1200 REM

```

INSTRUCTIONS

```

1210 HOME
1220 PRINT " >>> FILE CABINE
    T STUFFER <<<"
1230 PRINT
1240 PRINT "FILE CABINET STUFFER
    PROVIDES THE USER"
1250 PRINT "OF THE FILE CABINET
    DATA BASE PROGRAM"
1260 PRINT "A FAST WAY TO VIEW,
    ENTER, OR CHANGE"
1270 PRINT "A COMMON ITEM OR ITE
    MS IN EACH RECORD"
1280 PRINT "OF A FILE. THE USER
    IS FIRST ASKED TO"
1290 PRINT "CHOOSE A FILE FROM A
    LIST ON THE SCREEN.:"
1300 PRINT "HE IS THEN ASKED TO
    SELECT THE DATA TYPE:"
1310 PRINT "WHOSE CONTENTS WILL
    BE USED AS A PROMPT.:"
1320 PRINT "THE NUMBER OF ITEMS
    TO BE DISPLAYED, AND:"
1330 PRINT "WHICH ITEMS THEY ARE
    - IF ALL DATA ITEMS"
1340 PRINT "ARE TO BE DISPLAYED,
    'ALL' SHOULD BE"
1350 PRINT "ENTERED. <CTRL E> ER
    ASES AN EXISTING"
1360 PRINT "ENTRY, <CTRL A> ABOR
    TS THE CURRENT FILE"
1370 PRINT "OPERATION, AND <RETU
    RN> ACCEPTS THE"
1380 PRINT "EXISTING ENTRY. USE
    OF THE REPEAT KEY"
1390 PRINT "WITH <RETURN> PERMIT
    S SCROLLING THROUGH"
1400 PRINT "THE FILE TO THE DESI
    RED DATA ENTRY."
1410 PRINT
1420 PRINT
1430 VTAB 22: CALL - 958: PRINT
    "PRESS <RETURN> TO CONTINUE,
    <ESC> TO END": GET A$: PRINT
1440 IF A$ = CHR$(13) THEN GOSUB
    1480: RETURN
1450 IF A$ = CHR$(27) THEN HOME
    : END
1460 GOTO 1430
1470 REM

```

TITLE BLOCK

```

1480 HOME : VTAB 6: PRINT "*****
    *****"
1490 PRINT TAB(10)"FILE CABINE
    T STUFFER"
1500 PRINT
1510 PRINT TAB(15)"WRITTEN BY"
1520 PRINT
1530 PRINT TAB(14)"MIKE KRAMER
    "
1540 PRINT
1550 PRINT TAB(6)"HOUSTON AREA
    APPLE USERS GROUP"
1560 PRINT
1570 PRINT TAB(15)"MARCH 1982"
    : PRINT
1580 PRINT "*****"
1590 RETURN

```


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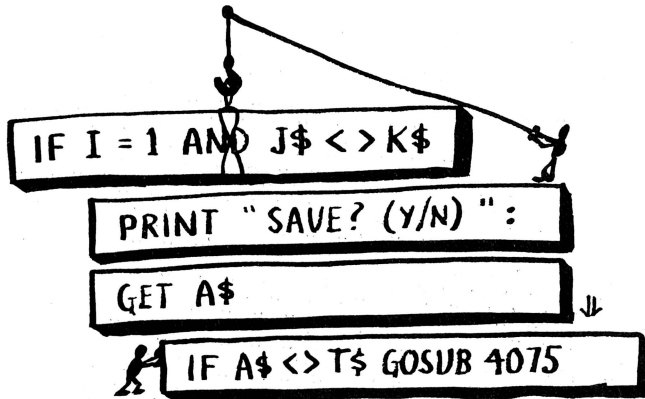
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APPLESOFT PROGRAM FORMATTING LISTER

by David H. Bartley



One of the handiest utilities for any language system is a formatting lister, or "pretty-print" routine. Having been spoiled by a good commercial Pascal pretty-printer on the job, I decided that I had to write one for use with Applesoft on the Apple at home. The built-in LIST command gives me the information I need, but it sure doesn't go out of its way to make it easy to read!

Most pretty-printers I'm familiar with are designed for printer output. I wanted mine to create nice hard-copy listings, but I also wanted to make it easier to display parts of a program in the Apple's screen in a more readable form. The Assembly language program in Listing 1 is the result of my efforts to do just that.

Program Features

My pretty-print routine for Applesoft programs was deviously loped adding the features listed below to the algorithm used by BASIC. (The original code may be found by disassembling from \$D6A5 to \$D765 in the ROM.)

1. The pretty-printer is easily initialized by typing "**BRUN A/S LISTER.**" Formatted listings are then generated by typing any of the LIST commands, preceded by an ampersand (&). The standard arguments (one line number, or two separated by a comma, or dash), are allowed. The word "LIST" may be abbreviated to "L." Output may be to the printer, to the screen, or both.

2. All program line numbers are displayed right-adjusted in the first five output columns. All program statements begin in Column 7.

3. Each statement separator (:) appearing past Column 12 causes a line break. The ":" is displayed in Column 4 of the following output line.

4. Lines usually extend to Column 38 instead of 33. The continuation of a long line is indented three extra spaces.

5. Each output line is indented an extra two spaces for each level of nested FOR...NEXT and IF...THEN statements. To avoid squeezing too closely against the right margin, indentation stops at Column 30.

6. A space is listed after every comma or semicolon (except those in REMs and quoted strings).

7. The output line is broken and continued whenever a space, comma, or semicolon appears past Column 33.

8. No extra blanks are displayed around the "*" and () tokens.

9. A blank is not listed before a keyword if the previous character is a blank or left parenthesis.

10. A blank is not listed after a keyword ending with a parenthesis (such as "TAB(", for example).

11. Non-printing control characters are listed as letters enclosed within square brackets.

12. The listing can be temporarily stopped and then resumed by hitting any key. Control-C may be used to cancel the listing.

Operational Requirements

There are a few things you need to be aware of, however. A/S LISTER must be used under DOS with Applesoft in ROM (or at the same locations in RAM card). It is not hidden above HIMEM, so it may be wiped out if your program or its data requires too much space. Another point: the "&" vector is used to enable RENUMBER; if you're using that utility while coding, you can't use the Lister, and vice versa.

There is one known bug: it doesn't realize that "NEXT I,J" ends two FOR...NEXT loops instead of one; the indentation will be slightly off. Since it's better programming practice to use "NEXT I : NEXT J," I haven't made provision for the sloppier form.

The Assembly language program in Listing 1 should be assembled and placed in the binary file "A/S LISTER." BRUNning that file loads the program in the Apple's memory at location \$6000 (just above Hi-Res Page 2), and sets up the ampersand vector. (Obviously, the ampersand vector can't be used for more than one purpose at a time.) Once loaded and initialized with BRUN, the program may be invoked with "& LIST" any number of times.

A/S LISTER uses several entry points into the Appleoft ROM as well as the "warm start" entry into DOS. It checks for the existence of Applesoft, so it is safe (but ineffective) to BRUN it from Integer BASIC. Don't try to BRUN it without DOS up, though!

Programming Style

You may want to spruce up your programs a bit to enhance the quality of formatted listings. I use these coding techniques to make my printed listings even more readable:

1. Don't play games with text in REMs. A hidden line feed (Control-J) or padding with blanks to get columns to line up won't necessarily work the same way with &LIST as with LIST. This is the main problem I've found when formatting existing programs.

2. Avoid ending more than one FOR on a single NEXT. The formatted listing will be correct, but the indentation will be off.

3. Don't put colons immediately after line numbers. Some people do this to force indentation of the listing. Let your Apple do it for you!

4. Add a colon after a THEN if the whole statement won't fit on the same line or if there are several statements in the THEN CLAUSE.

An Example

Figures 1 and 2 contrast the listing formats of the standard Applesoft LIST command, and &LIST. Several, but not all, of the features of AS/LISTER are illustrated in this short example. Figure 3 shows what happens when the adjacent NEXT I and NEXT J are combined into a single NEXT I,J.

Figure 1

```
]LIST
100 REM -- SAMPLE NONSENSE PROGR
    AM
110 READ M,N: DATA 100,200:
120 FOR I = 1 TO M: FOR J = 1 TO
    N
130 ANSWER = (3 * I + J ^ 2) / 2
140 IF I = J THEN : PRINT "I = J
    ":ANSWER = 1 / ANSWER
150 PRINT TAB( 10);"ANSWER = ";
    ANSWER
160 NEXT J: NEXT I
170 END
```

Summary

Whether used for prettier hardcopy listings of Applesoft programs or as a nicer way to view them as they are being developed, A/S LISTER has fulfilled by expectations. I hope you'll find it just as helpful. But, since few people seem to agree on questions of style and the "correct" formatting of program listings, please feel free to adapt A/S LISTER to *your* requirements and aesthetics.

Figure 2

```
]BRUN A/S LISTER
```

```
APPLESOFT PROGRAM LIST FORMATTER
(C) 1981 - D H BARTLEY - AUSTIN, TEXAS
TO USE, PRECEDE EACH 'LIST' WITH &
```

```
]&LIST
```

```
100 REM -- SAMPLE NONSENSE PROGRAM
110 READ M, N
    : DATA 100, 200
    :
120 FOR I = 1 TO M
    : FOR J = 1 TO N
130     ANSWER = (3*I + J^2) / 2
140     IF I = J THEN
        : PRINT "I = J"
        : ANSWER = 1 / ANSWER
150     PRINT TAB(10); "ANSWER =
        "; ANSWER
160     NEXT J
    : NEXT I
170 END
```

Figure 3

```
]&LIST
```

```
100 REM -- SAMPLE NONSENSE PROGRAM
110 READ M, N
    : DATA 100, 200
    :
120 FOR I = 1 TO M
    : FOR J = 1 TO N
130     ANSWER = (3*I + J^2) / 2
140     IF I = J THEN
        : PRINT "I = J"
        : ANSWER = 1 / ANSWER
150     PRINT TAB(10); "ANSWER =
        "; ANSWER
160     NEXT J, I
170 END
```


Listing #1

```

1000      .OR $6000      (24576 DEC.)
1010      .TF A/S LISTER
1020      *
6000- 4C 89 60 1030      JMP INIT      INIT ENTRY
1040      *
1050      *****
1060      *
1070      *      Applesoft      *
1080      *      Program List Formatter      *
1090      *      by David H Bartley      *
1100      *
1110      *****
1120      *
1130      *      Improvements Made:
1140      *
1150      * = The LIST command must be
1160      * preceded by "&" to use this
1170      * version. It may be typed as
1180      * either "&LIST" or "&L". The
1190      * standard arguments (one line
1200      * number, or two separated by
1210      * , or -) are allowed.
1220      *
1230      * = Each line number is right-
1240      * adjusted in the first five
1250      * columns. All statements now
1260      * start at column 7.
1270      *
1280      * = Lines extend to column 38
1290      * instead of 33 (usually). The
1300      * continuation of a long line
1310      * is indented 3 extra spaces.
1320      *
1330      * = Each output line is indented
1340      * an extra two columns for each
1350      * level that "FOR" and "IF"
1360      * statements are nested. The
1370      * indentation stops 10 columns
1380      * from the right margin.
1390      *
1400      * = Listing can be temporarily
1410      * stopped by hitting any key.
1420      * Ctrl-C still cancels listing.
1430      *
1440      * = A space is now printed after
1450      * every ",", or ";" (except
1460      * those in REM's or strings).
1470      *
1480      * = An output line will be broken
1490      * and continued whenever a ",",
1500      * ";", or " " appears within 7
1510      * columns of the right margin.
1520      *
1530      * = Each statement separator (:)

```

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```

1540 *    appearing past column 12
1550 *    causes a line break. The ':'
1560 *    is listed in column 4 of the
1570 *    new output line.
1580 *
1590 * = Tokens * and ^ are not
1600 *    surrounded by blanks.
1610 *
1620 * = A blank will not be listed
1630 *    before a token if the
1640 *    previous char was a blank
1650 *    or left parenthesis.
1660 *
1670 * = A blank will not be listed
1680 *    after a token ending in "("
1690 *
1700 * = Control characters are listed
1710 *    as normal capitals enclosed
1720 *    in brackets (e.g. [J]).
1730 *
1740 *-----
1750 *
1760 * APPLESOFT/MONITOR ROUTINES
1770 *
00B1- 1780 CHRGET .EQ $00B1
00B7- 1790 CHRGOT .EQ $00B7
DAFB- 1800 CRDO   .EQ $DAFB
D61A- 1810 FNDLIN .EQ $D61A
ED34- 1820 FOUT   .EQ $ED34
D858- 1830 ISCNTC .EQ $D858
DA0C- 1840 LINGET .EQ $DA0C
D7D2- 1850 NEWSTT .EQ $D7D2
DB5C- 1860 OUTDO   .EQ $DB5C
DEC9- 1870 SNERR   .EQ $DEC9
DB3A- 1880 STROUT  .EQ $DB3A
1890 *
FDED- 1900 COUT    .EQ $FDED
1910 *-----
1920 *
1930 * SYSTEM VARIABLES
1940 *
0024- 1950 CH      .EQ $24
009D- 1960 DSCTMP .EQ $9D
0085- 1970 FORPNT .EQ $85
0050- 1980 LINNUM .EQ $50
009B- 1990 LOWTR  .EQ $9B
0021- 2000 WNDWTH .EQ $21
2010 *
C000- 2020 KBD     .EQ $C000    KEYBOARD
C010- 2030 KBDSTR .EQ $C010    KBD STROBE
2040 *-----
2050 *
2060 * LOCAL VARIABLES
2070 *
6003- 00 2080 CONFLG .DA #0
6004- 00 2090 PREVCH .DA #0

```

```

6005- 00      2100 TABFOR .DA #0
6006- 00      2110 TABIF .DA #0
6007- 00      2120 TXTFLG .DA #0
                2130 *
                2140 *   The following line buffer must
                2150 *   begin on an address below XF0,
                2160 *   where X may be any page.
                2170 LINBFR

6008- 20 20 20
600B- 20 30      2180      .HS 2020202030 " 0"
600D- 30 30 30
6010- 30 00      2190      .HS 3030303000 "0000!"
600A-      2200 LINBF2 .EQ LINBFR+2
6005-      2210 LINBF3 .EQ LINBFR-3
                2220 *
6012- 8D 8D 8D      2230 BANNER .HS 8D8D8D
6015- A0 A0 A0
6018- A0 C1 D0
601B- D0 CC C5
601E- D3 CF C6
6021- D4 A0 D0
6024- D2 CF C7
6027- D2 C1 CD      2240      .AS -"   APPLESOFT PROGRAM"
602A- A0 CC C9
602D- D3 D4 A0
6030- C6 CF D2
6033- CD C1 D4
6036- D4 C5 D2      2250      .AS -" LIST FORMATTER"
6039- 8D      2260      .HS 8D   C/R
603A- A8 C3 A9
603D- A0 B1 B9
6040- B8 B1 A0
6043- AD A0      2270      .AS -"(C) 1981 - "
6045- C4 A0 C8
6048- A0 C2 C1
604B- D2 D4 CC
604E- C5 D9 A0
6051- AD A0      2280      .AS -"D H BARTLEY - "
6053- C1 D5 D3
6056- D4 C9 CE
6059- AC A0 D4
605C- C5 D8 C1
605F- D3      2290      .AS -"AUSTIN, TEXAS"
6060- 8D      2300      .HS 8D   C/R
6061- A0 A0 A0
6064- A0 D4 CF
6067- A0 D5 D3
606A- C5 AC A0
606D- D0 D2 C5
6070- C3 C5 C4
6073- C5 A0      2310      .AS -"   TO USE, PRECEDE "
6075- C5 C1 C3
6078- C8 A0 A7
607B- CC C9 D3
607E- D4 A7 A0
6081- D7 C9 D4

```



```

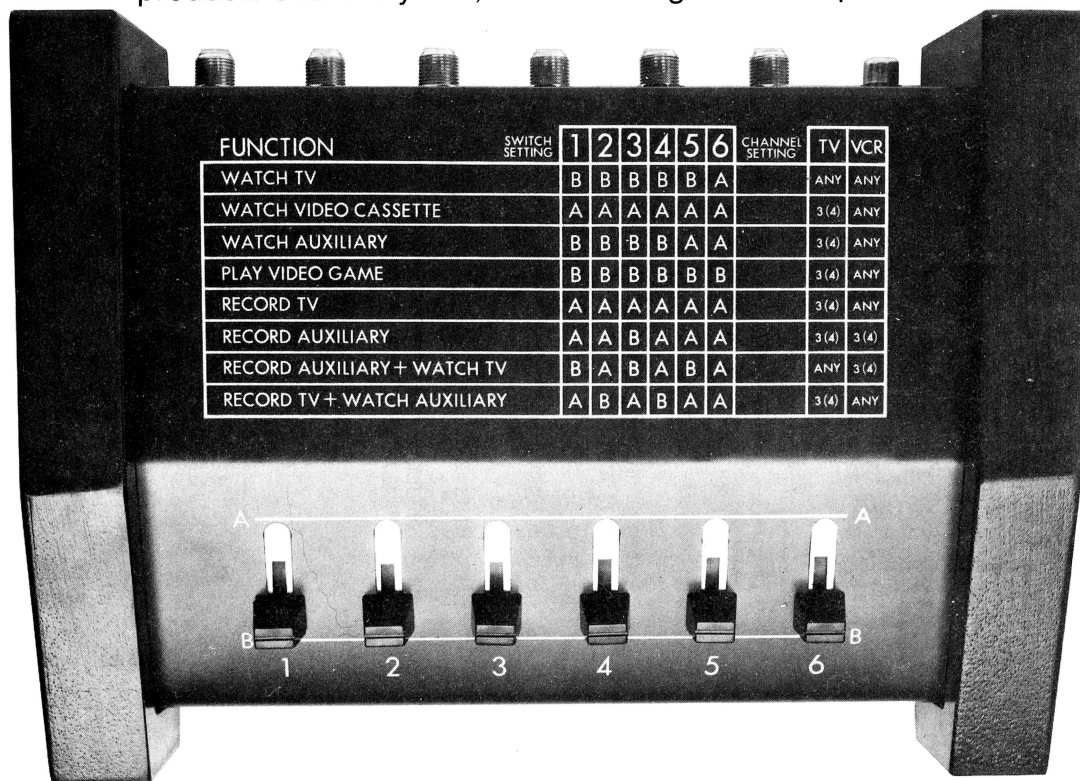
6084- C8 A0 A6 2320      .AS -"EACH 'LIST' WITH &"
6087- 8D 00      2330      .HS 8D00      C/R      EOT
                2340 *-----
                2350 INIT
6089- A9 28      2360      LDA #$28      CHECK FOR A/S ROM
608B- CD 01 E0 2370      CMP $E001
608E- D0 1B      2380      BNE DOS      -NOT THERE!
6090- A9 4C      2390      LDA #$4C      "JMP" OPCODE
6092- CD 00 E0 2400      CMP $E000
6095- D0 14      2410      BNE DOS      -NOT THERE!
                2420 *
6097- 8D F5 03 2430      STA $3F5      & VECTOR
609A- A9 AE      2440      LDA #AMPER
609C- 8D F6 03 2450      STA $3F6
609F- A9 60      2460      LDA /AMPER
60A1- 8D F7 03 2470      STA $3F7
                2480 *
60A4- A9 12      2490      LDA #BANNER      DISPLAY BANNER
60A6- A0 60      2500      LDY /BANNER      TEXT MESSAGE
60A8- 20 3A DB 2510      JSR STROUT
                2520 DOS
60AB- 4C D0 03 2530      JMP $03D0      --> DOS/BASIC
                2540 *-----
                2550 AMPER
                2560 *
                2570 * AMPERSAND ENTRY POINT
                2580 *
60AE- AA      2590      TAX      SAVE 1ST TOKEN
60AF- 20 B1 00 2600      JSR CHRGET      GET 2ND TOKEN
60B2- 08      2610      PHP      SAVE STATUS
                2620 *
60B3- E0 BC      2630      CPX #188      "LIST" TOKEN?
60B5- F0 08      2640      BEQ XLIST
60B7- E0 4C      2650      CPX #$4C      "L" CHAR?
60B9- F0 04      2660      BEQ XLIST
60BB- 28      2670      PLP
                2680 ERROR
60BC- 4C C9 DE 2690      JMP SNERR      SYNTAX ERROR
                2700 *-----
                2710 XLIST
60BF- 28      2720      PLP
60C0- 90 0A      2730      BCC LIS010      DIGIT NEXT
60C2- F0 08      2740      BEQ LIS010      : OR EOL
60C4- C9 C9      2750      CMP #$C9      "-" TOKEN
60C6- F0 04      2760      BEQ LIS010      LIST -...
60C8- C9 2C      2770      CMP #$2C      ", " CHAR
60CA- D0 F0      2780      BNE ERROR      -ERROR
                2790 LIS010
60CC- 20 0C DA 2800      JSR LINGET      GET LINE NR
60CF- 20 1A D6 2810      JSR FNDLIN      LOWTR -> LINE
60D2- 20 B7 00 2820      JSR CHRGOT      NEXT CHAR
60D5- F0 10      2830      BEQ LIS030      : OR EOL
60D7- C9 C9      2840      CMP #$C9      "-" TOKEN
60D9- F0 04      2850      BEQ LIS020
60DB- C9 2C      2860      CMP #$2C      ", " CHAR
60DD- D0 DD      2870      BNE ERROR      -ERROR

```

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2880 LIS020      60DF- 20 B1 00 2890      JSR CHRGET      NEXT CHAR
60E2- 20 0C DA 2900      JSR LINGET      PARSE LINE NR
60E5- D0 D5 2910      BNE ERROR      -ERROR
2920      *      : OR EOL
2930 LIS030      60E7- A9 00 2940      LDA #0
60E9- 8D 05 60 2950      STA TABFOR      NR FOR'S := 0
60EC- A5 50 2960      LDA LINNUM      2ND LINE NR
60EE- 05 51 2970      ORA LINNUM+1
60F0- D0 06 2980      BNE LIS040      2ND LINE GIVEN
60F2- A9 FF 2990      LDA #FF
60F4- 85 50 3000      STA LINNUM      DEFAULT 2ND
60F6- 85 51 3010      STA LINNUM+1      LINE NUMBER
3020      *-----*
3030 LIS040      60F8- A0 01 3070      LDY #1
60FA- B1 9B 3080      LDA (LOWTR),Y LINK HI BYTE
60FC- F0 4F 3090      BEQ LIS200      END OF PROGRAM
60FE- 20 9B 62 3100      JSR PAUSE      STOP LIST ?
6101- 20 FB DA 3110      JSR CRDO      OUTPUT CAR RET
6104- C8 3120      INY      Y := 2
3130      *
3140      * CHECK FOR LINE NUMBER IN RANGE
3150      *
6105- B1 9B 3160      LDA (LOWTR),Y LO BYTE OF
6107- AA 3170      TAX      LINE NUMBER
6108- C8 3180      INY      Y := 3
6109- B1 9B 3190      LDA (LOWTR),Y
610B- C5 51 3200      CMP LINNUM+1      HI BYTES
610D- D0 04 3210      BNE LIS050
610F- E4 50 3220      CPX LINNUM      LO BYTES
6111- F0 02 3230      BEQ LIS060
3240 LIS050      6113- B0 38 3250      BCS LIS200      END OF RANGE
3260 LIS060      6115- 84 85 3270      STY FORPNT      (TEMP SAVE)
3280      *
3290      * PRINT THE LINE NUMBER
3300      *
6117- 20 77 62 3310      JSR XLINPR      PRINT LINNUM
611A- A9 00 3320      LDA #0
611C- 8D 06 60 3330      STA TABIF      NR NESTED IF'S
611F- 8D 07 60 3340      STA TXTFLG      NO "/REM YET
6122- 20 29 62 3350      JSR INDENT
6125- A9 00 3360      LDA #0
6127- 8D 03 60 3370      STA CONFLG
612A- A9 20 3380      LDA #20
3390      *
3400      * PRINT NEXT CHARACTER OR TOKEN
3410      *
3420 LIS100      612C- A4 85 3430      LDY FORPNT      (RESTORE Y)

```

```

612E- 29 7F 3440      AND #$7F      MASK CHAR
6130- 20 6D 62 3450      JSR XOUTDO      OUTPUT CHAR
6133- A9 02 3460      LDA #2      CURSOR W/IN 2
6135- 20 4B 62 3470      JSR OVRFLD      OF WINDOW?
3480 LIS120      6138- C8 3490      INY      NEXT INPUT POS
6139- 84 85 3500      STY FORENT      (SAVE Y)
613B- B1 9B 3510      LDA (LOWTR),Y GET CHAR/TOKEN
613D- D0 14 3520      BNE LIS300      -VALID BYTE
3530      *
3540      * END OF LINE, MOVE TO NEXT LINE
3550      *
613F- A8 3560      TAX      Y := 0
6140- B1 9B 3570      LDA (LOWTR),Y LINK PTR, LO
6142- AA 3580      TAX
6143- C8 3590      INY      Y := 1
6144- B1 9B 3600      LDA (LOWTR),Y LINK PTR, HI
6146- 86 9B 3610      STX LOWTR
6148- 85 9C 3620      STA LOWTR+1
614A- 4C F8 60 3630      JMP LIS040
3640      *-----*
3650 LIS200      614D- 20 FB DA 3690      JSR CRDO      NEW LINE
6150- 4C D2 D7 3700      JMP NEWSTT      EXIT
3710      *-----*
3720      *
3730      * PROCESS NEXT CHAR/TOKEN
3740      *
3750 LIS300      6153- C9 22 3760      CMP #$22      (") CHAR
6155- D0 0A 3770      BNE LIS301      TOGGLE THE
6157- A9 80 3780      LDA #$80      TEXT FLAG
6159- 4D 07 60 3790      FOR TXTFLG
615C- 8D 07 60 3800      STA TXTFLG
615F- A9 22 3810      LDA #$22      (") CHAR
3820 LIS301      6161- AE 07 60 3830      LDX TXTFLG      IN REM/TEXT?
6164- D0 5B 3840      BNE LIS600      -YES
3850      *
6166- C9 2C 3860      CMP #$2C      ", " CHAR
6168- F0 04 3870      BEQ LIS310      ",;" CHAR
616A- C9 3B 3880      CMP #$3B
616C- D0 05 3890      BNE LIS320
3900 LIS310      616E- 20 6D 62 3910      JSR XOUTDO      PRINT CHAR
3920      LDA #20      SPACE CHAR
3930 LIS320      6171- A9 20 3940      CMP #20
6173- C9 3A 3950      CMP #$3A      ":" CHAR
6175- D0 1D 3960      BNE LIS330      -NO
3970      *
3980      * BEGIN A NEW STATEMENT (:)
6177- AE 03 60 3990      LDX CONFLG      CONTINUED LINE?

```

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617A- D0 06	4000	BNE LIS325	-YES	61DE- C9 00	4560	CMP #0	
617C- A6 24	4010	LDX CH	HORZ. CURSOR	61E0- 30 03	4570	BMI LIS700	-TOKEN
617E- E0 0C	4020	CPX #12	PAST COL 12?	61E2- 4C 2C 61	4580	JMP LIS100	-ASCII CHAR
6180- 90 12	4030	BCC LIS330	-NO	4590	LIS700		
6182- 20 FB DA	4040	LIS325		4600	*		
6185- A9 03	4050	JSR CRDO	-YES	4610	* TOKEN - LOOK IT UP		
6187- 20 36 62	4060	LDA #3		4620	*		
618A- A9 3A	4070	JSR TAB	TAB TO COL 4	4630	SEC		
618C- 20 6D 62	4080	LDA #3A	" : " CHAR	4640	SBC #7F		
618F- 20 29 62	4090	JSR XOUTDO		4650	TAX		
6192- D0 98	4100	JSR INDENT	CONTINUE	4660	LDA #SD0		
	4110	BNE LIS100		4670	STY DSCTMP		DSCTMP :=
	4120	LIS330		4680	LDA #SCF		TABLE ADDR
6194- C9 CA	4130	CMP #SCA	**" TOKEN	4690	STY DSCTMP+1		
6196- D0 02	4140	BNE LIS332	**" CHAR	4700	LDA #SFF		
6198- A9 2A	4150	LDA #2A		4710	LIS710		
	4160	LIS332		4720	DEX		LINEAR SEARCH
619A- C9 CC	4170	CMP #SCC	"^" TOKEN	4730	BEQ LIS730		-TOKEN FOUND
619C- D0 02	4180	BNE LIS334		4740	LIS720		
619E- A9 5E	4190	LDA #5E	" " CHAR	4750	JSR \$D72C		GET NEXT TABLE
	4200	LIS334		4760	*		ENTRY CHAR
61A0- C9 C4	4210	CMP #SC4	"THEN" TOKEN	4770	BPL LIS720		-NOT LAST CHAR
61A2- D0 03	4220	BNE LIS340	TAB 2 COLUMNS	4780	BMI LIS710		-LAST CHAR
61A4- EE 06 60	4230	INC TABIF		4790	LIS730		
	4240	LIS340		4800	*		
61A7- C9 81	4250	CMP #81	"FOR" TOKEN	4810	* DSCTMP NOW POINTS TO THE		
61A9- D0 03	4260	BNE LIS350	TAB 2 COLUMNS	4820	* TABLE ENTRY FOR THE TOKEN		
61AB- EE 05 60	4270	INC TABFOR		4830	*		
	4280	LIS350		4840	LDA #7		NEAR LINE END?
61AE- C9 82	4290	CMP #82	"NEXT" TOKEN	4850	JSR OVRFL0		CHECK WINDOW
61B0- D0 08	4300	BNE LIS360		4860	LIS735		
61B2- CE 05 60	4310	DEC TABFOR	END OF 'FOR'	4870	LDA #528		"(" CHAR
61B5- 10 03	4320	BPL LIS360	TABFOR >= 0	4880	CMP PREVCH		"(" -> "("
61B7- EE 05 60	4330	INC TABFOR	TABFOR := 0	4890	BEQ LIS740		
	4340	LIS360		4900	LDA #520		SPACE CHAR
61BA- C9 B2	4350	CMP #8B2	"REM" TOKEN	4910	CMP PREVCH		DOUBLE SPACE?
61BC- D0 03	4360	BNE LIS370		4920	BEQ LIS740		-YES
61BE- EE 07 60	4370	INC TXTPFG	REM/TEXT FLAG	4930	JSR XOUTDO		-NO, PRINT ONE
	4380	LIS370		4940	LIS740		
	4390	LIS600		4950	JSR \$D72C		GET NEXT TABLE
61C1- C9 20	4400	CMP #520	SPACE CHAR	4960	*		ENTRY CHAR
61C3- F0 12	4410	BEC LIS605	-SPACE CHAR	4970	BMI LIS750		-LAST CHAR
61C5- B0 17	4420	BCS LIS610	-PRINTABLE CHAR	4980	JSR XOUTDO		PRINT CHAR
61C7- 48	4430	PHA	-CONTROL CHAR	4990	BNE LIS740		(ALWAYS TAKEN)
61C8- A9 5B	4440	LDA #5B		5000	LIS750		
61CA- 20 6D 62	4450	JSR XOUTDO	LEFT BRACKET	5010	CMP #5A8		"(" "
61CD- 68	4460	PLA		5020	BEQ LIS760		"(" -> "("
61CE- 09 40	4470	ORA #540	MAKE PRINTABLE	5030	JSR XOUTDO		PRINT LAST CHR
61D0- 20 6D 62	4480	JSR XOUTDO		5040	LDA #520		SPACE CHAR
61D3- A9 5D	4490	LDA #55D	RIGHT BRACKET	5050	LIS760		
61D5- D0 07	4500	BNE LIS610		5060	JMP LIS100		-LOOP
	4510	LIS605		5070	*		
61D7- A9 07	4520	LDA #7	GOOD PLACE TO	5080	INDENT		
61D9- 20 4B 62	4530	JSR OVRFL0	BREAK OUTPUT?	5090	*		
61DC- A9 20	4540	LDA #520	SPACE CHAR	5100	* INDENT ACCORDING TO NESTING		
	4550	LIS610		5110	* LEVEL OF "FOR" AND "IF" STATE-		

COMMUNICATE!

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Businessmen

- Q.** Do you have difficulty operating your printer when connected to a time-sharing computer? Are files you're trying to download too large for your system buffer? Does your host computer lose data when you send files to it?
- A.** "The Professionals" incorporate printer ring buffers which allow slower printers to accept data at their own rates. Very large files are easily received by periodically saving the buffer to disk. Unlike some software which can lose data during disk saves, "The Professionals" not only direct the host to stop, but actually wait for it to respond before performing the save. After a successful save, the host is automatically directed to continue. This process may be repeated indefinitely. Lost data during send is virtually eliminated by the widest variety of send options available in any communications software. "The Professionals" ensure fast, reliable data transfer of any valuable business information.

Authors

- Q.** Does your line of work involve sending written material to others? Are you a program author who would like to send work in progress to a partner or client and know that it arrived intact? What would the ability to instantly send material or programs to anyone at any time be worth to you?
- A.** "The Professionals" provide the ideal way to send your articles, manuscripts, reports, programs and technical documents to another computer with phone line access. Now you can work WHEREVER you want, and be assured that your data is sent to its destination quickly and error-free. In fact, compared to the fastest mail services, "The Professionals" offer immediate delivery and will save you the purchase price in just a few uses.

Students

- Q.** Are you bothered by limited access to your school's existing terminals? Would you like to be able to do your school assignments at home at your own convenience?
- A.** "The Professionals" allow you to access virtually any dial-up school or college computer system over standard telephone lines. This means no more waiting in line for an available terminal or hassles with malfunctioning school equipment. You can even prepare term papers or reports while off-line and send the completed work to the school computer for final printing. Best of all, you can work from home at the times most convenient for you.

Time Share Users

- Q.** Are you tired of wasting time and money sending or receiving files with inadequate, poorly designed software? Do you find yourself manually performing the same lengthy log-in procedures over and over again? Would you like to automate these procedures for yourself and others?
- A.** "The Professionals" allow you to send files which have been prepared in advance. They may then be transferred at any time, as quickly as possible — even to several different systems. No time is wasted reviewing information while on line; data may be captured by your computer or printer (or both) to be evaluated later at your convenience. These features assure minimum on-line time and therefore minimum on-line cost.
- "The Professionals" introduce macros that are more sophisticated than anything previously seen in communications software. These "hand-shaking" macros allow you to perform complete multi-stage log-on sequences automatically; all you do is specify the system to be called. This eliminates sign-on errors and greatly simplifies operation of the entire system, not only for you, but for other less skilled operators.

Bulletin Boards

- Q.** Would you like to be able to take advantage of the information featured on local bulletin boards and information services such as The Source, CompuServe, Dow Jones, and others?
- A.** "The Professionals" open the world of modem communication networks to you. There are already thousands of these systems and networks in use nationwide. "The Professionals" provide an ideal way of accessing these systems. All 80 column boards, external terminals (even the 40 column screen), and currently available communications devices are fully supported, including the Hayes Micromodem II and Novation Apple CAT. All standard baud rates — 110, 300, 1200 and others — are fully supported; BAUDOT too, if your computer is equipped with the Apple CAT modem.

Clubs

- Q.** Are there other Apple owners with whom you would like to exchange programs or files, but have been unable to do so because of limitations imposed by the software you now use?
- A.** Any two Apples equipped with "The Professionals" can transfer ANY type or size file with complete error checking and correction. All of "The Professional" packages are fully conversant with each other and operate almost identically. For the first time ever, you can transfer compatible files to an operating system different from yours — error free!

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```

5120 * MENTS. ENTRY "TAB" IS USED
5130 * FOR ARBITRARY TABBING.
5140 *
6229- EE 03 60 5150 INC CONFLG CONTINUED LINE
622C- 18 5160 CLC
622D- AD 05 60 5170 LDA TABFOR (NR OF FOR'S
6230- 6D 06 60 5180 ADC TABIF + NR OF IF'S)
6233- 2A 5190 ROL *2
6234- 69 05 5200 ADC #5 +5
5210 TAB
6236- 48 5220 PHA SAVE TAB VALUE
6237- C5 24 5230 CMP CH THERE YET?
6239- 30 2B 5240 BMI TAB4 -YES
623B- F0 29 5250 BEQ TAB4 -YES
623D- A5 24 5260 LDA CH TOO NEAR THE
623F- C9 1E 5270 CMP #30 RIGHT MARGIN?
6241- 10 23 5280 BPL TAB4 -YES, GET OUT
6243- A9 A0 5290 LDA #SA0 -NO
6245- 20 ED FD 5300 JSR COUNT PRINT BLANK
6248- 68 5310 PLA TAB VALUE
6249- D0 EB 5320 BNE TAB (ALWAYS TAKEN)
5330 OVRFL0
624B- 18 5340 CLC IS THE CURSOR
624C- 65 24 5350 ADC CH IN THE RIGHT
624E- C9 28 5360 CMP #40 MARGIN?
6250- B0 01 5370 BCS OVRFL2 -YES
6252- 60 5380 RTS -NO
5390 OVRFL2
6253- 20 FB DA 5400 JSR CRDO OVERFLOW TO
6256- EE 05 60 5410 INC TABFOR THE NEXT LINE
6259- EE 05 60 5420 INC TABFOR AND INDENT
625F- 20 29 62 5430 JSR INDENT EXTRA SPACES
625E- CE 05 60 5440 DEC TABFOR
6262- CE 05 60 5450 DEC TABFOR
6265- 48 5460 PHA (MATCH PLA)
5470 TAB4
6266- 68 5480 PLA TAB VALUE
5490 TAB5
6267- A9 20 5500 LDA #S20 " " CHAR
6269- 8D 04 60 5510 STA PREVCH
626C- 60 5520 RTS
5530 XOUTDO
626D- 8D 04 60 5540 STA PREVCH SAVE THE CHAR
6270- C9 00 5550 CMP #0
6272- F0 F3 5560 BEQ TAB5 -NULL CHAR
6274- 4C 5C DB 5570 JMP OUTDO LIST IT
5580 *-----*
5590 XLINPR
5600 *
5610 * PRINT THE LINE NUMBER RIGHT-
5620 * ADJUSTED IN A 5-CHAR FIELD.
5630 *
6277- 85 9E 5640 STA $9E SET UP 'FAC'
6279- 86 9F 5650 STX $9F WITH LINNUM
627B- A2 90 5660 LDX #90
627D- 38 5670 SEC

```

```

627E- 20 A0 EB 5680 JSR $EBA0 FLOAT FAC
6281- 20 34 ED 5690 JSR FOUT BINARY->DEC
5700 XLINP2
6284- C8 5710 INY COPY DIGIT TO
6285- B9 FE 00 5720 LDA $FE,Y BLANK-FILLED
6288- 99 0A 60 5730 STA LINBF2,Y BUFFER
5740 BNE XLINP2
628B- D0 F7 5750 *
628D- 98 5760 TYA NR CHARS+2
628E- 18 5770 CLC
628F- 69 05 5780 ADC #LINBF3 COMPUTE START
6291- AA 60 5790 TAX OF 5 CHARACTER
6292- A9 60 5800 LDA /LINBF3 FIELD IN THE
6294- 69 00 5810 ADC #0 BUFFER
6296- A8 5820 TAY
6297- 8A 5830 TXA (Y,A) -> BUF
5840 *
5850 JMP STROUT PRINT IT
5860 *-----*
5870 PAUSE
5880 *
5890 * CHECK FOR KEY DOWN. IF SO,
5900 * WAIT UNTIL ANOTHER KEY DOWN
5910 * BEFORE CONTINUING. IF CTRL-C,
5920 * CANCEL AND RETURN TO BASIC.
5930 *
629B- 2C 00 C0 5940 BIT KBD KEY DOWN ?
629E- 10 11 5950 BPL PAUSE9 -NO
62A0- 20 58 D8 5960 JSR ISCNTC CTRL-C CHECK
62A3- 2C 10 C0 5970 BIT KBDSTR CLEAR STROBE
5980 PAUSE2
62A6- 2C 00 C0 5990 BIT KBD DOWN AGAIN ?
62A9- 10 FB 6000 BPL PAUSE2 -NO, WAIT
62AB- 20 58 D8 6010 JSR ISCNTC CTRL-C CHECK
62AE- 2C 10 C0 6020 BIT KBDSTR CLEAR STROBE
6030 PAUSE9
6040 RTS
6050 *-----*
6060 ZZZZZZ .EN

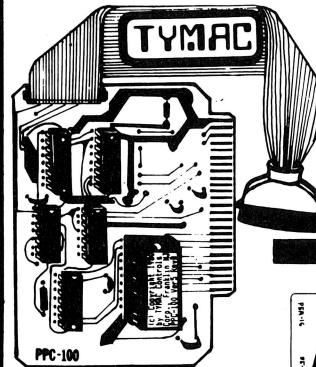
```

SYMBOL TABLE

60AE-	AMPER	61FD-	LIS730
6012-	BANNER	6202-	LIS735
0024-	CH	6213-	LIS740
00B1-	CHRGET	621D-	LIS750
00B7-	CHRGOT	6226-	LIS760
6003-	CONFLG	009B-	LOWTR
FDED-	COUT	D7D2-	NEWSTT
DAFB-	CRDO	DB5C-	OUTDO
60AB-	DOS	6253-	OVRFL2
009D-	DSCTMP	624B-	OVRFLO
60BC-	ERROR	629B-	PAUSE
D61A-	FNDLIN	62A6-	PAUSE2
0085-	FORPNT	62B1-	PAUSE9
ED34-	FOUT	6004-	PREVCH
6229-	INDENT	DEC9-	SNERR
6089-	INIT	DB3A-	STROUT
D858-	ISCNTC	6236-	TAB
C000-	KBD	6266-	TAB4
C010-	KBDSTR	6267-	TAB5
600A-	LINBF2	6005-	TABFOR
6005-	LINBF3	6006-	TABIF
6008-	LINBFR	6007-	TXTF LG
DA0C-	LINGET	0021-	WNDWTH
0050-	LINNUM	6284-	XLINP2
60CC-	LIS010	6277-	XLINPR
60DF-	LIS020	60BF-	XLIST
60E7-	LIS030	626D-	XOUTDO
60F8-	LIS040	62B2-	ZZZZZZ
6113-	LIS050		
6115-	LIS060		
612C-	LIS100		
6138-	LIS120		
614D-	LIS200		
6153-	LIS300		
6161-	LIS301		
616E-	LIS310		
6173-	LIS320		
6182-	LIS325		
6194-	LIS330		
619A-	LIS332		
61A0-	LIS334		
61A7-	LIS340		
61AE-	LIS350		
61BA-	LIS360		
61C1-	LIS370		
61C1-	LIS600		
61D7-	LIS605		
61DE-	LIS610		
61E5-	LIS700		
61F3-	LIS710		
61F6-	LIS720		



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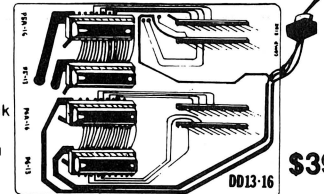


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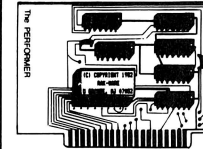
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EDUCATIONAL USES OF THE COMPUTER

by Ted Perry

Educational Uses of the Computer

The last few months have produced a number of new educational magazines, the message of which is that the educational uses of the computer are beginning to flower. It is now possible to buy a computer solely for educational uses, and to find programs which legitimately justify the purchase. The time is ripe to explore some of the possible educational uses of the Apple.

The educational uses of computers divide into two general categories: computer assisted instruction, and computer literacy. In this article we'll consider some of the computer assisted instruction applications, saving computer literacy for a later article. Computer assisted instruction (CAI) can be further divided into subcategories, such as drill and practice, simulation, and problem solving. Some programs are written specifically for CAI; others can be adapted for teaching purposes. The two extremes in CAI are drill and practice, and game-like simulations for the improvement of thinking skills.

Drill and practice is what most people think of when the words "computer assisted instruction" appear. There is a place for the computer version of the flash card. My first original program was a multiplication game. It was easy to write:

- Generate two random numbers and their product;
- Print the two numbers and ask for the product;
- Compare the response with the known product;

Provide appropriate feedback to the student.

The program was used by my kids for more than a month, when I discovered that there could be more to CAI than straight drill; it was possible for the CAI program not only to conduct the drill and keep score, but also to save that information on a disk. In this manner I could easily follow each student's daily progress.

Milliken Math was one of the first commercially available sets of materials that included full lesson planning and data collection. Once I installed several sets of materials that included data collection; the computer was keeping the records, giving the children one-on-one practice, providing appropriate feedback, and scoring the tests. The students (and their teacher!) were enjoying the fruits of the Apple.

The students continued to enjoy the drill and practice as long as the problems were at an appropriate skill level, but I wanted more from the computer. I wanted to stimulate higher levels of thinking; I wanted the computer to teach problem solving.

In the quest for problem solving software, I found the programs that simulate the sale of lemonade or crossing the U. S. in a covered wagon, but I wanted more: a generic problem solving curriculum. I have not yet found it (if you know of one, please contact me . . .), but I did discover the Adventure Game.

For readers unfamiliar with adventure programs, take as an example the Princess and the Wizard, an adventure by On-Line Systems. As you boot the disk, you're greeted by beautiful Hi-Res graphics, in color. The graphics change continually, showing you your surroundings as you explore the environment. You explore by typing two-word sentences, one noun, one verb. e. g., "GO NORTH," "GET ROCK," "EAT APPLE," etc. You start in a small town, and are told that you must rescue a princess, who has been kidnapped by an evil wizard. This isn't simple; if the adventurer takes the task lightly, he will "die" rapidly. Care and forethought are rewarded; for example, if you "GET ROCK" without looking behind it, you may be bitten by a scorpion, ending that adventure quickly and (for you) fatally. (A more thorough discussion of adventure games can be found in *Apple Orchard*, Fall 1981; back issues are available.)

With these adventures, I have filled classrooms with creative problem-solving discussions at very high levels of thinking. Students have discussed the possible outcomes of innumerable actions, and have gotten to a point that it is hard to find a program that completely surprises them (*Not bad training for today's world! -PCW*) Creative essays have been written by the students about the adventures, and the adventures have been rated for both difficulty and creativity. Students get together at recess time to plan their next assault on the wizard's castle. I have accomplished my goal through the use of a set of programs initially meant for recreational purposes.

The moral of my story is: don't look for educational programs only in the math section of your software supermarket.

In future issues of *Apple Orchard* we'll explore the educational uses of the Apple; this is your magazine, for comments and/or contributions. Address your letters to Ted Perry, ED-SIG, c/o Apple Orchard.



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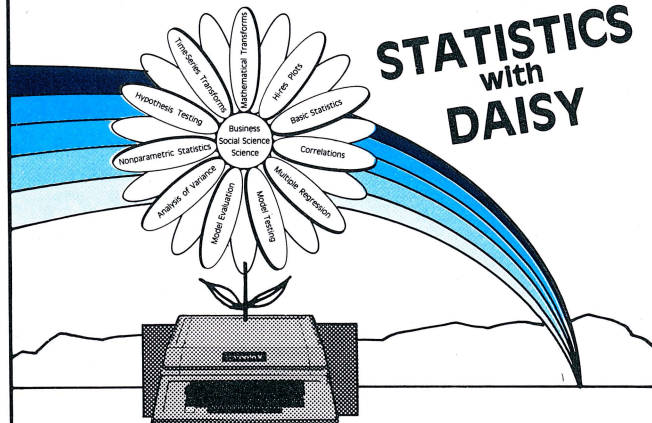
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HELLO, OPERATOR?

(What's an Operating System Anyway?)

by Joe Budge

There is something eerie about computers nowadays: they're too quiet. All those brains packed in that tiny box, but the box just sits there. No lights flash, no bells ring. The *fwap-fwap-fwap* of shuffling cards is gone, along with the *whirr* and *click* of flying tapes. Instead, you can occasionally hear a muted whisper from the disk drive. Progress, that password of the century, has eliminated the army of lights, buzzers, and switches that used to make us think of computers in capital letters. Progress, embodied in software, turned that cacophony into a silent *hummm*. Software not only replaced the barrage of gadgets, it also supplanted the people those gadgets were built for. These were the "computer monitors," the anointed who told the idiot savant what to do, when to do it, and how to behave. They called themselves system operators. Programmers, showing their infinite capacity for cleverness, named the new software packages "operating systems."

If a central processor is a computer's heart, then the operating system is its soul. The operating system determines every computer's personality. Give an Apple /// the software replica of the Apple II's ROM-contained operating system. Poof! Like a transvestite, the /// thinks it's a II. Feed the /// its own SOS, and it regains its own identity. Commands, capabilities, and restrictions vary widely between computer languages, but all of the

behavioral differences come from the operating system. Take the example of printers and other plug-in devices. Apple Pascal always knows where these goodies are plugged in and how to work them. In contrast, the BASIC user must enter slot numbers, initiation codes, and other technical what-not. But the difference lies in the operating systems, not the languages. So what is an operating system, anyway?

Back in the old days, at least thirty years ago, there was no such thing as an operating system. Computers could only run one program at a time. Typically, only a few input and output devices were attached to the electronic brain. The system operator, a human being, would load a deck of cards into a card reader, set the appropriate switches on the computer, and then punch the "GO" button. When the program was done, its output would appear on a printer, punched tape, or new deck of cards. The operator would retrieve these materials, then set up for the next program. Not only did this make for long days, but there was so much running around that the computer sat idle most of the time. With computers costing millions of dollars, this was simply intolerable. Why not include some extra cards with the program, some software, to handle the set-up and link in the next job? Such were the meager beginnings of the operating system.

As computers grew in size and cost, it was discovered that the systems were still cooling their heels too often. The computer could compute about a thousand times faster than card readers could read, or printers could print. Well, why not let the computer work on several things at once? While one job was printing, a second could be running, and a third could be read. Just tack the extra control software onto the operating system. As a side benefit, the operating system learned how to work all of the peripheral, or plug-in, hardware. Programs didn't have to be as complicated or detailed as before. Thus, life became a bit easier for computer programmers.

And then along came disk drives. All of a sudden, data access could be *fast*. No one had to go get your card deck or tape any more; it was already hooked up to the computer. Since no one could type as fast as computers could compute, the gurus let several people type at once. Not to worry; the operating system kept track of who was doing what. They called this new operating system feature "timesharing."

Now, microcomputers are kind of simple-minded, as computers go. They don't have multiple users, virtual memory, time sharing, and all the other fancy features built into large computers. At least not yet. So the operating system in a microcomputer

can be a lot simpler. Really, all it needs to do is keep track of what's where in memory, handle file storage, and make all the input and output devices work. How the operating system goes about this gives the computer some kind of "personality." Consider that if all the data files, programs, input, and output must go through the operating system, why then *everything* goes through the operating system. That piece of software is the principal power broker of the computer.

To do its job, the operating system contains three categories of sub-programs, which it uses to get different kinds of work done. The first group consists of the device drivers, which tell the hardware what to do and when. The drivers contain instructions for putting characters on a screen, for making disk drives work, for sounding the bell, and all the other physical things a computer can do. As you can imagine, these are fundamental programs which the com-

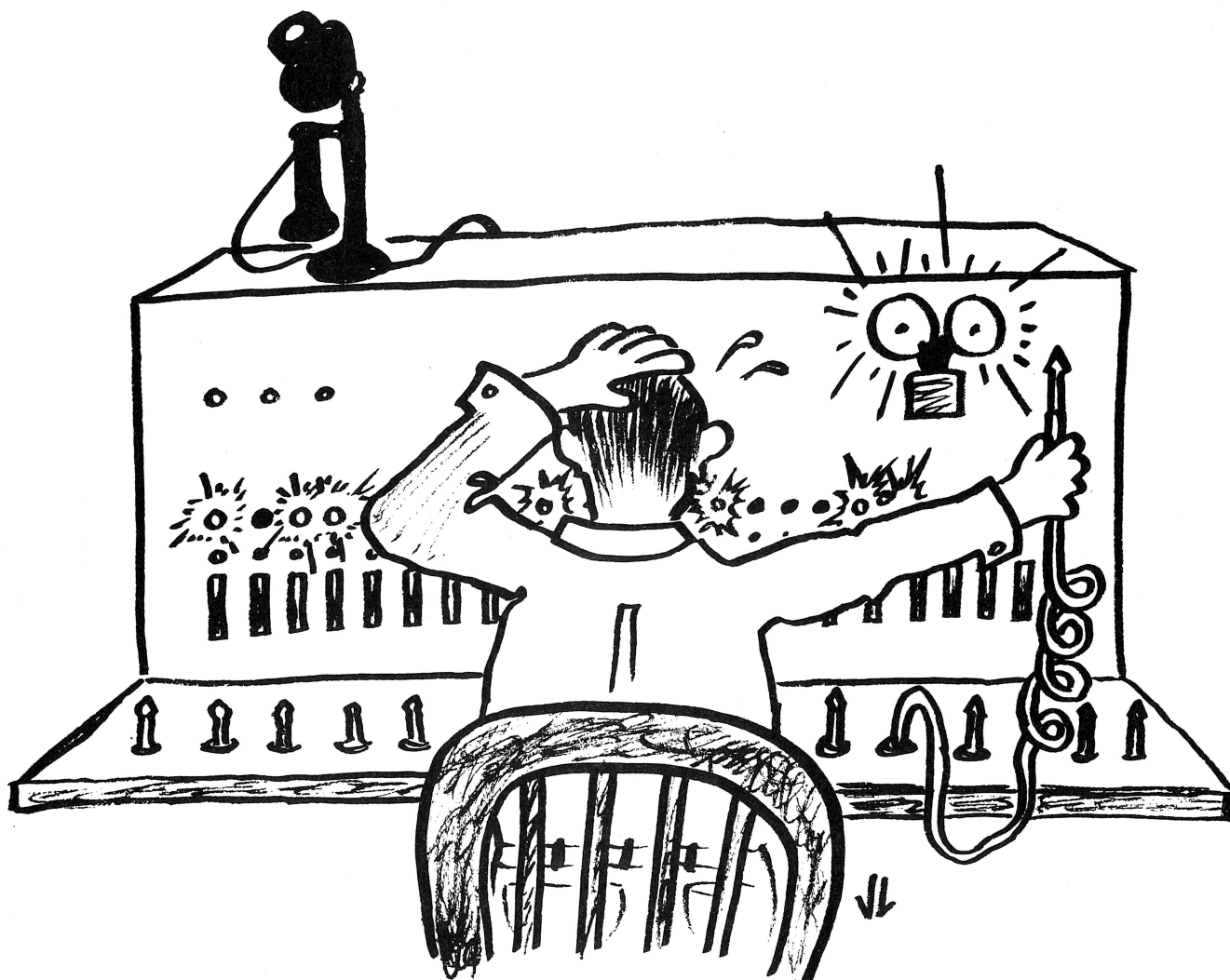
puter must have to operate. The second group of programs keeps lists of information; lists of what's stored where, lists of what programs are in memory, lists of where everything is in the computer. The third group of programs is the interpreters for operating system commands. These take commands, figure them out, and determine which programs from the first two groups must run in order to follow the command.

Each of the sub-programs in the operating system plays an important role in giving the computer its personality. Apple DOS (Disk Operating System) disks, Pascal disks, and Apple /// SOS disks are physically identical. The only difference is that the list keeper in each operating system works in a different fashion. Since one list keeper doesn't know how another works, these three types of disks can only be used on the operating system they first came from. Other sub-programs have similar effects. To list

the contents of a disk, for example, the BASIC programmer with Apple DOS types "CATALOG." The interpreter knows what to do with that command, and programs from the device drivers and list keepers are called into play to produce a catalog.

In the Pascal system, on the other hand, the programmer must enter a special interpreter called a "Filer," and then type "L" for "Listing," or "E" for "Extended Directory Listing." Since the operating system is all software, there's no reason why the same function in the two systems couldn't have been identical, but they aren't. The differences usually arise because one programmer thinks he has a better way, or needs to accommodate some special functions.

(Note: there's more humanity in these machines than meets the eye. A computer's "personality" usually is not too far removed from the human who designed the operating



system. For example, an error message could be "Syntax Error," "You goofed, Dummy," "Error 423G," or "Please try again." Which raises the question, To what extent is "artificial intelligence" merely our own reflection in an electronic mirror, rather than a new source? —PCW)

Ideally, sub-programs in all three groups should be independent of each other. Then, if a computer owner decides to do something different with his computer, he must change only the appropriate piece. Want a new disk drive? Change the disk driver. Want a different character font on the screen? Change the screen driver. Want a different set of commands, or a new one? Change the command interpreter. The Apple ///'s SOS works this way, which is the major advance in that computer (not four arrows on the keyboard).

Sometimes the operating system is split up among many different pieces of software, however. In the Apple II, for instance, a program called the "Monitor" contains the sub-programs which work the video display and keyboard. Sub-programs which run

printers are built into the interface cards you plug into the slots. Sub programs for the disk drives come in DOS. Some of the programs are built into the computer using ROM (read-only memory) chips, so they can't be changed; any major changes would instantly render most of your software or hardware useless. As a consequence, any changes must be "patched" in with awkward signals. This is why the Apple II BASIC programmer must start all DOS commands with a Control-D, for example. To get around this problem, Pascal, using the language card, turns off the Apple II's built-in software. With the built-in software out of the way, new operating systems can work in the Apple II.

There's even a trend afoot to add a new level of programs to the operating system. If you've ever played with Pascal, you know that the system software includes something called a "text editor." This is a program which lets you enter, edit, and save typewriting in the computer. The editor is there because you can't write a program without it. But it turns out that the editor has all kinds of other handy

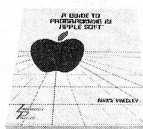
uses, not the least of which is word processing. Just a few years ago, this would have been called applications software. Guess what? Almost every operating system on a microcomputer contains some form of editor now. These range from the simple Escape-JKM commands of Apple II BASIC to the full-blown word processor that comes with the Osborne computer.

The trend is leading toward simplification of the operating system from the user's point of view. Operating systems, you see, used to be written by programmers for programmers. But non-programmers are using computers now. Non-programmers have neither the time nor the patience to learn a long list of operating system commands. To overcome this hurdle, operating systems are starting to use menus, from which a user selects the program or function of his choice, just like choosing a meal in a restaurant. Special ways of pointing at the screen are being invented. In effect, the user will be able to point at the screen and say, "I want that." Who knows, one of these days, we might be able to figure out these machines.

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By Bruce Presley

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THREE PASCAL "FEATURES"

by Paul A. Sand

It's often the case that what one person considers to be a bug in a program may be perceived as an unimportant quibble by someone else, or perhaps even a beneficial aspect. The saying, "That's not a bug, it's a *feature!*" is a relatively well-known epigram from the bizarre world of computer humor, showing that there can occasionally be disagreement about the seriousness of abnormal program behavior. In the course of writing a number of Pascal pro-

grams on the Apple II, I've come across three interesting quirks in the system that I haven't seen described before. Since you and I may not agree on the importance of these oddities, I'll avoid calling them "bugs," and you can draw your own conclusions.

1) The MOD Function

Apple Pascal's MOD function behaves neither like the standard mathematical definition of MOD, nor like the definition given in most Pascal texts, including *Pascal User Manual and Report* by Jensen and Wirth. To demonstrate, we first need a little background.

The conventional definition of the MOD function (see, for example, Knuth's *Fundamental Algorithms*, Page 38) is something like this:

$$A \text{ MOD } B = A - B * \text{FLOOR}(A/B)$$

(assuming $B \ll 0$)

where the "floor" function is further defined as:

$$\text{FLOOR}(X) = \text{"The largest integer } \leq X \text{"}$$

On the other hand, most Pascal texts either define MOD by saying "A MOD B is the remainder when A is divided by B," or, as in Jensen and Wirth (Page 13), they may use the formula:

$$A \text{ MOD } B = A - B * (A \text{ DIV } B)$$

The problem with these two definitions is that, depending on Pascal's implementation of "DIV," the two formulas can give two different answers when A or B are negative. In the case of Apple Pascal, they do in fact give different answers. What's worse is that the actual MOD function in Apple Pascal can give a *third* different answer! The program in Listing 1 gives an example.

In this program, the function "imod" was written to return the conventional value of A MOD B. The program simply asks for two integers, A and B, then returns the value of A MOD B calculated by the MOD function and also the two definitions above. If one enters the values -2 for A and 12 for B, the resulting output looks like this:

```
A = -2
B = 12
A MOD B = 2
A - B * (A DIV B) = -2
imod(A, B) = 10
```

That's three different answers for the same problem, depending on how we do the MOD calculation. The moral

LISTING 1

```
program testmod;

var
  a, b: integer;

function imod(a, b: integer): integer;
(* Return a mod b, standard definition *)
var
  r: real;
  i: integer;

begin
  r := a/b;
  i := trunc(r);
  if (r >= 0) or (i = r) then
    imod := a - b * i
  else
    imod := a - b * (i - 1)
end;

begin
  repeat
    write('Input a:');
    readln(a);
    write('Input b:');
    readln(b);
    writeln('a = ', a);
    writeln('b = ', b);
    writeln('a mod b = ', a mod b);
    writeln('a - b * (a div b) = ',
            a - b * (a div b));
    writeln('imod(a, b) = ', imod(a, b))
  until a = 0
end.
```


here is: Don't always expect books to tell you what the computer is going to do.

2) Real Number Input

It's a frustrating thing to be forced to write your own routine to accomplish a certain task when you know that such a routine already exists, but is inaccessible to you. One such example in the Pascal system is the conversion of a string of characters into a number. The system "knows" how to do the translation — it happens every time a value is typed in at the keyboard or read from a text file. But if you want your program to do the same thing, you'll have to write your own procedure to do it, because the system hides the procedure from you.

Let's assume you want to write a routine to translate a string of characters into a real number. One of the things you should know while writing such a module is the smallest and largest positive real numbers the system can represent, so your routine can avoid over- and underflows. To determine these values, you might write a program like this:

```
program readreal;
```

```
var
x: real
begin
while TRUE do
begin
write('Enter x:');
readln(x);
writeln('x = ',x)
end
end.
```

This program will blow up with a floating point execution error if you type in a number too large or too close to zero. With experimentation, you'll find that the largest real number Pascal can represent is approximately $3.40E38$, and the smallest positive real number is approximately $1.18E-38$. Or, more accurately, these are the limits on the numbers one can enter using the READ procedure.

A problem arises when you try to incorporate the smaller number into a program. If you use the lines:

```
const
TINY = 1.18E-38
```

or even:

```
IF X >+ 1.18e-38 THEN ...
```

... the Pascal compiler will (Kaboom!) self-destruct on attempting to translate the number. To be more precise, the compiler program itself will halt with a floating point execution error.

What does this mean? Apparently, there are actually *two* different routines in the Pascal system for translating strings of characters into real numbers: one used by the READ statement, and one used by the compiler. And the routine the compiler uses will not translate some numbers which offer no problem to the other one.

Here's an example of another symptom of having two different real number conversion routines:

```
program realtest;
```

```
var
x: real;
```

```
begin
repeat
write('Enter x:');
readln(x);
writeln('x = ',x)
until x = 2.718281828
end.
```

Most programmers know better than to compare two floating point numbers for exact equality. But in this example we might reasonably expect such a comparison to work. If you enter "2.718281828" the program should react normally, shouldn't it? Well, in Apple Pascal, it doesn't. The two different conversion routines translate the strings (in the program and in the READ statement) into two ever so slightly different floating point representations. The comparison fails, and the program continues on.

There's no good reason why there should be more than one such routine in the Apple Pascal system. (The one you may have to write will be at least the third!) A major benefit of using a modular programming language like Pascal is that one can write a single reliable procedure to accomplish a given task, and use it in a variety of applications. The moral: Duplicated programming effort is not only wasteful, but it can lead to —er, "features" — in your programs.

3) Real Number Output

We just discussed the frustration one feels when a routine must be written to do something the system already knows how to do. Another kind of pain results when the language texts and system documentation spell out in detail what a given function does in different circumstances — and then in practice the function actually does something entirely different.

Such is the case with the standard procedures WRITE or WRITELN when they are used to output real numbers. Most texts, as well as Apple's own documentation, (see the *Apple Pascal Language Reference Manual*, Pages 36-37) describe the procedure as follows: The statement:

WRITELN(X: W: D)

... will cause the real number X to be written, after it is converted to a string. The optional variables W and D control the output format; W is the minimum number of characters that will be printed, and D is the number of digits to be printed after the decimal point.

So far, so good. Consider the program in Listing 2:

LISTING 2

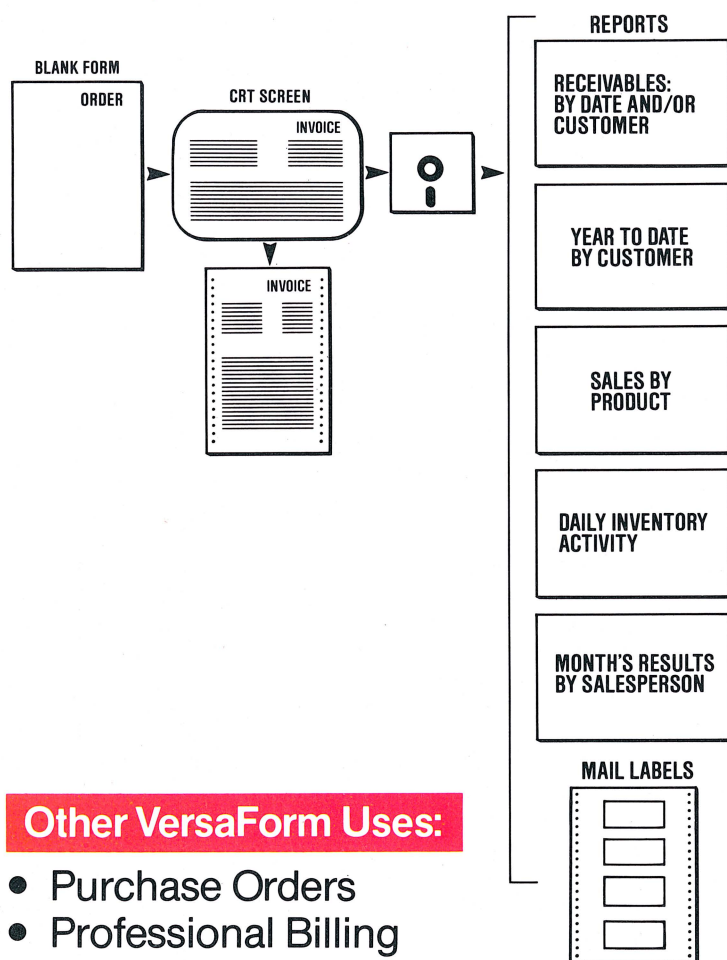
```
program testwrite;
```

```
var
w, d, i : integer;
x : real;

begin
x := 0.123456;
w := 20;
d := 8;
for i := 1 to 10 do
begin
writeln(x: w: d);
x *:= (10 * x)
end
end.
```

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Based on the above discussion, we would expect something like the following output:

```
0.12345600
1.23456000
12.34560000
123.45600000
1234.56000000
12345.60000000
123456.00000000
1234560.00000000
12345600.00000000
123456000.00000000
```

Instead, when we run the program, we get:

```
0.123456 M
1.23456
12.3456
123.456
1234.56
12345.6
123456.
1.23456E6
1.23456E7
1.23456E8
```

What's the problem here? Not only does Pascal fail to print the eight digits we requested after the decimal point, it also switches over to scientific notation after a certain point. And the extraneous "M" that appears after the first number is certainly a strange — er, "feature." I don't know what else to say about it. It seems that the output routines will display a maximum of six significant digits in a real number, presumably to protect the user from misinterpreting the results of his/her program. The programmers who decided to implement real number formatting in this way no doubt had good reasons (in their own minds) for their decision, but the problem is that such behavior contradicts the documentation and most Pascal texts.

So here's one possible solution to the problem; Listing 3 is a simple routine to convert a real number to a formatted string, using the same parameters for minimum field width and digits after the decimal point:

LISTING 3

```
procedure rtos(var s: string; r: real;
               len, ndigits: integer);
(* Convert real number (r) to a string (s) *)
(* len = minimum field width *)
(* ndigs = no. of digits after decimal pt. *)
var
    negnum: boolean;
    sl: string[1];
    e, expo, i: integer;
    pl0: real;
begin
    s := '';
    sl := ' ';
    negnum := (r < 0.0);
    r := abs(r) + 0.5/pwroften(ndigits);
    expo := 0;
    e := 32;
```

```
while e > 0 do begin
    pl0 := pwroften(e);
    while r >= pl0 do begin
        r := r/pl0;
        expo := expo + e
    end;
    e := e div 2
end;
for i := expo downto 0 do begin
    sl[i] := chr(trunc(r) + 48);
    s := concat(s, sl);
    r := 10.0 * (r - trunc(r))
end;
if ndigits > 0 then begin
    s := concat(s, '.');
    for i := 1 to ndigits do begin
        sl[i] := chr(trunc(r) + 48);
        s := concat(s, sl);
        r := 10.0 * (r - trunc(r))
    end
end;
if negnum then
    s := concat('-', s);
while length(s) < len do
    s := concat(' ', s)
end;
```

The routine could, for example, replace the statement:

WRITELN(X: W: D);

with the two statements:

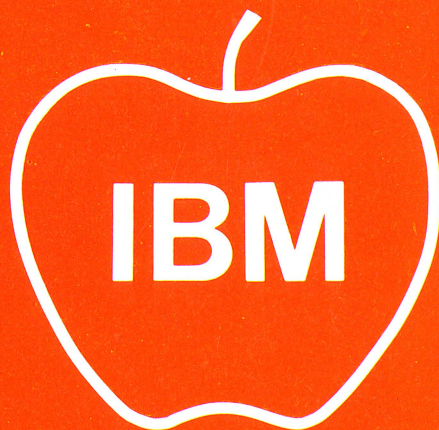
RTOS(S, X, W, D);
WRITELN(S)

Disclaimer: Listing 3 isn't meant to be a general-purpose real-to-string routine, just an indication of a possible solution. It doesn't take too much care in checking its input parameters, and it returns "noise" digits in the output string if one attempts to obtain more digits than Pascal can represent accurately. But enhancements to correct these features are easy to add; they are left to the interested reader.

Conclusion

I've tried to demonstrate three problems in Apple's implementation of Pascal. I don't want to make more out of it than is necessary; seen in the context of the whole Pascal system, they are relatively minor surprises that the majority of programmers will perhaps never come across. Apple Pascal, in my opinion, is still an excellent choice for software development.

On the other hand, I don't want to minimize the seriousness of such language quirks. They are undocumented pitfalls that the programmer must discover and avoid, so they do make one's programming effort more difficult. They also damage one of Pascal's nicest benefits: its portability. A Pascal program written on the Apple can be moved (in theory) to another computer and run with relatively little modification, and vice versa. But deviations and — er, "features" like these can make such modifications much more difficult.



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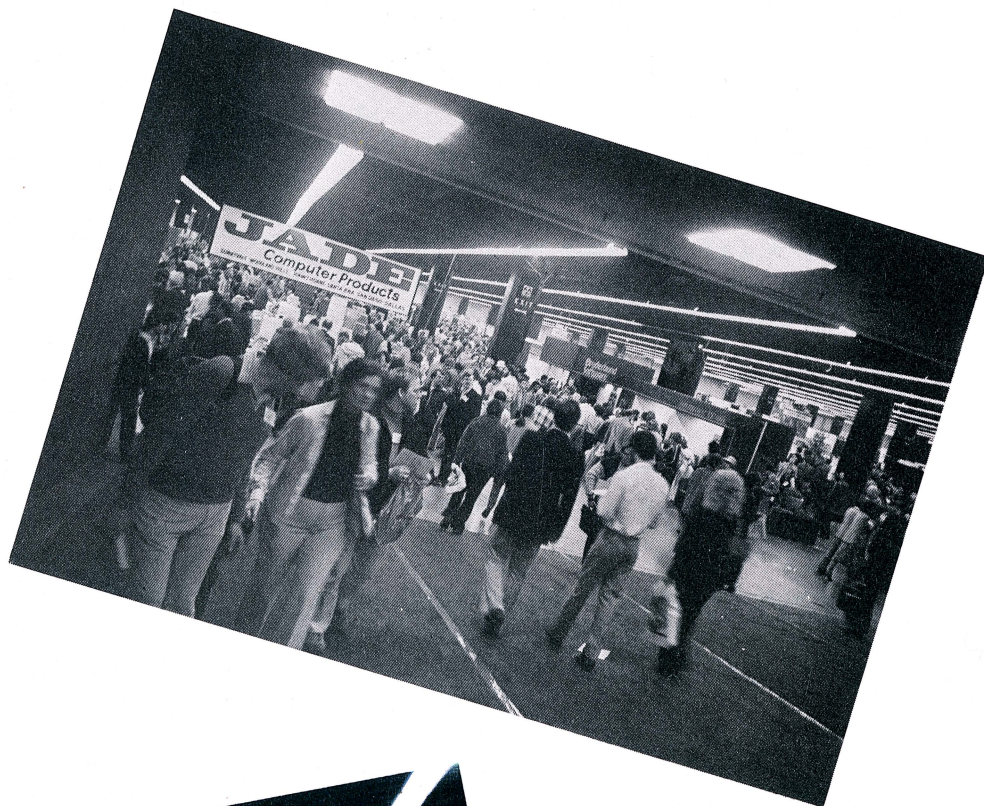
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SEVENTH ANNUAL COMPUTER FAIRE

by Amanda Hixson

For the past several years we have been presented with the West Coast Computer Faire and Convention. This event is the brain child of Jim Warren, and has been a showcase for the computer enthusiast in the past. In fact, the Apple II computer was first introduced at a previous West Coast Faire. Little did anyone know, then...

Some of the prior shows have resembled crowded bazaars rather than sophisticated demonstrations of current computer products. This year's Show bore much less resemblance to a town square market place than past shows. Certainly, there were the usual masses of computer fanatics, but this year's Faire contained some striking new elements. The most important was the concentration on the end user, and the increasing professionalism by both manufacturers and retailers.



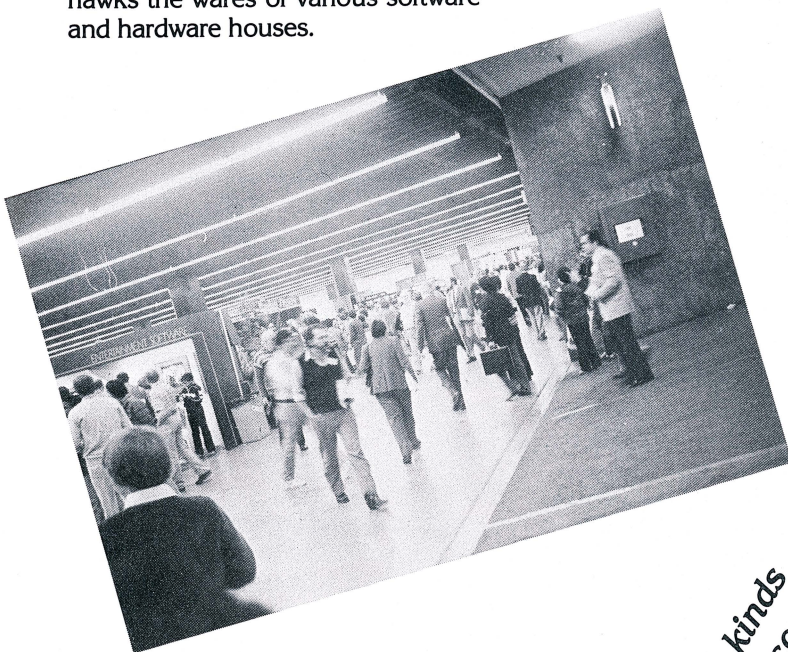
There were more three-piece suits; fewer blue jeans.

In the past, it had often been difficult to tell the buyers from the sellers. Much of this was due to the industry's lack of polish, and the quickness with which the industry was developing. This year's Faire evidenced a maturation of both the consumers and the vendors present. No longer will we deal only with the blue-jeaned programmer; now we must contend with the slick Madison Avenue professional in the three-piece suit as he hawks the wares of various software and hardware houses.

access) is around \$500, and additional boards run around \$180 per station. The whole system operates with a number of hard or floppy disk systems.

Not only does industry competition create a competitive basic price structure for the consumer, but it also creates the need for new product development and upgrading of already existing packages. This benefits

those of us who already own systems because it gives us a wide variety of products from which to choose, whether they are completely new and different or just enhancements of currently available software. Some of the products generated for the Apple are the result of this process, and this year's Faire included some of these items. There were several printer attachments which created storage buffers for different Apple compatible printers, like the Epson line. Several of these buffers have the capacity to store up to 32K of information, and



New Products and Prices

This fierce competition in the computer industry will benefit the consumer for many reasons, the most important one being the lowering of prices for many types of computer products. Apple users became very aware of this as they made their way through the throngs and were confronted with items like Xebec's 5-megabyte hard disk system for less than \$1500. (*Xebec showed poor taste in their slogan, though; imagine "Join the Hardcore...Forget the Applecore...." Forget, heck!! —PCW*). Also mentioned was a twenty-five meg 5¼" hard disk system being developed by one of the industry front-runners, with possible release by the end of the year. There was also a remote operating system for the Apple which could handle up to 127 remote Apples, and which was not proprietary to Corvus or any other single manufacturer's drives. The cost of the initial system (two or three user

Prices on many kinds of peripherals are coming down.



make it possible for the user to use the computer while the printer is printing reports or other information. One unit, the "Doubletimer," included an interrupt method for the Apple. These are very nice for people who often find they are losing valuable time because they have to wait for the printer to finish before they can resume data input. One version of this add-on even has an isolator with two external outlets for attaching still more peripherals to your Apple.

Much of the software and hardware wasn't really new, but some of it was made available to other machines, like Versa-form for the Apple ///. Many programs and hardware which previously were not able to run on the Apple /// were available at this year's Faire. Unfortunately, still isn't as much as the Apple /// user could hope for.

One interesting sidelight was the combination of a ///, an ink-jet color printer, and noted artist Saul Bernstein. Mr. Bernstein is working on an internal project for Apple Computer, and was doing portraits with a graphics tablet and light pen, much to the enjoyment of the crowd. (*More on Mr. Bernstein is scheduled for our July-August issue.*)

Games

An area of interest to many Apple users is in game software, which was present in great profusion at this year's convention. Games have been an area of frustration for many adults. Many claim that they attended this year's Faire to see the latest developments in *useful* programs, and are annoyed by the game vendors who jam every aisle with groups of children gathering around machines to watch their friends blast alien invaders, perform daring escapes and rescues, and die a thousand deaths.

Games abounded; and the kids were the experts.

It was almost impossible to get close to machines where games were being played; but it seemed to me that many of the adults' *real* annoyance came from the fact that *they* wanted to play the games, and knew that most of the kids could beat the *pants* off of them, so they were too embarrassed to play.

The large number of games has created a real problem for manufacturers because they must be highly innovative in order to stay ahead of their market. The short lives of many game programs make it very difficult for these companies to maintain interest in some of their products. Because of this, the consumer has to be very careful in selecting games. Slick packages often hide poor products in this area. This marketing technique is probably one of the hardest to penetrate, and special care should be exercised in buying game software. Many game programs for the Apple have similar names and very fancy jackets and trying to find the best of the lot is often difficult.

Other Games

The Seventh Faire could be called the Year of the Copycat. Many companies were displaying products that were very similar to products already on the market. The Franklin computer purported to be compatible with most of the products available for the Apple, but did not come with any standard color capability. Color does not seem to be an insurmountable problem; it just takes the time and



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effort to develop it. But the Franklin comes with standard 80-column upper and lower case letters. There was also a machine, very similar to the Apple, which was designed for the European market and had a European keyboard and fonts.

Several companies went after other established machines. The Osborne I, last year's portable newcomer, was upstaged this year by the Otrona and the Keycomp II, new entries trying to grab a segment of the rapidly growing "sewing machine look alike" market.

In addition to machine copies, there were also many add-on boards and peripherals which give one machine the characteristics of another. For the Apple, this meant the introduction of boards similar to those which run the IBM Personal Computer. Several boards of this type are available, and they give the Apple II access to programs written for the IBM. That's an indication of why the Apple is still a very popular machine. It's possible to create so many peripherals which give the dedicated Apple user the ability to derive benefit from items developed for other machines. 8088, 6809,

68000 (!) and other similar boards are evidence that the development of other system hardware will continue for Apple users.

Professionalism is coming to the micro industry . . . at last.

And From Here...

Many of the larger companies are engaged in closed door meetings to begin development of products designed to capture a large market share of the new market created by these machines. One area where a large concentration of effort is taking place is in the choice of operating systems for these new products. We will probably begin to experience a struggle between different operating system development companies and will probably begin to see variations on UNIX, OASIS, and other in-house operating systems.

Many people at the Faire expected to see a new 16-bit machine an-

nounced by Apple. Even though this did not take place, there was a good deal of speculation. The machine is ready. It's not ready. It's ready, and they're developing an operating system. The operating system is finished. It's a hybrid of Apple ///'s SOS. No, it isn't. Besides, that's a new operating system for the II also. Naahh. We won't know for sure until the information is released, but it's hard to believe that Apple Computer, Inc. will not make every attempt to retain their position in the market place, and it's becoming obvious that the 16-bit machine is the next step in micro evolution.

The final word on the 7th Annual Computer Faire is that the micro computer industry is finally started to grow into the professional stage. Although the bulk of the merchandise was not new, it was presented in a much more accomplished way than ever before. Care was exercised in approaching the different consumer groups attending this year's show, and the percentage of new users was very high.

It is becoming more apparent that the constant barrage of commercials aimed at the less sophisticated user is finally taking hold. We now know that the graphics displayed on television look very inviting to someone who has never experienced those generated by a mini or mainframe, and this year's show was well-stocked with persons there who had shelled out \$15 per head to "just find about the things they had seen on TV." Care will be taken by hardware and software houses to bring slowly the non-computer buff into active participation in the growing environment. More money is, and will continue to be, spent on cultivating the new user.

As for those in the industry, we must now wait to see what the next twelve months will bring. We should begin to see the avalanche of 16-bit machines and hardware in the next year. We may have to wait for Faire #9 until we have any amount of software for these machines, but in the meantime we will be able to enjoy what is already here and the multitude of variations which will undoubtedly develop over the next year for the current crop of machines.

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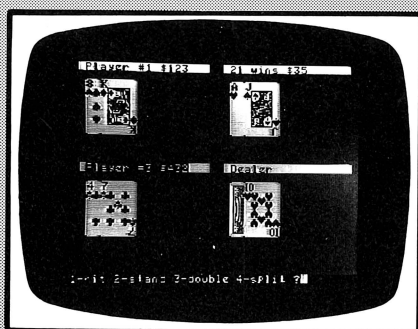
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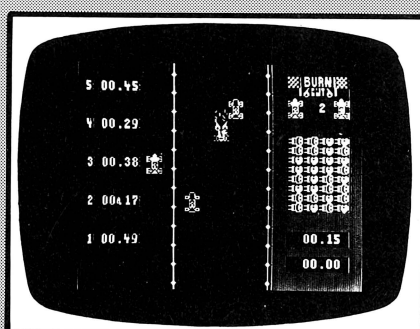
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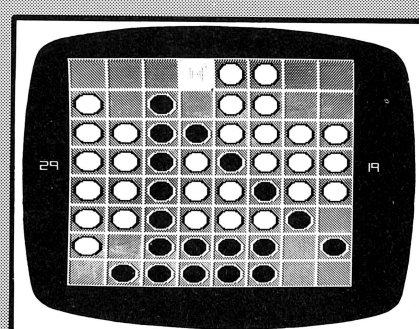




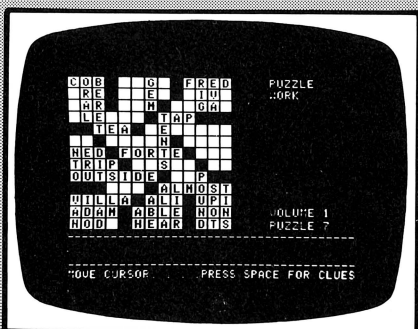
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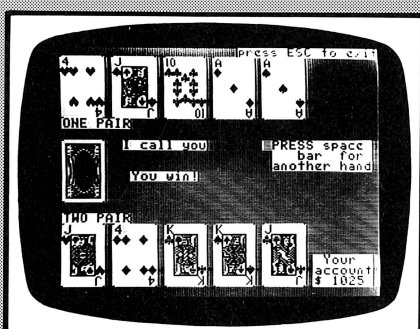
5. BAKER'S TRILOGY



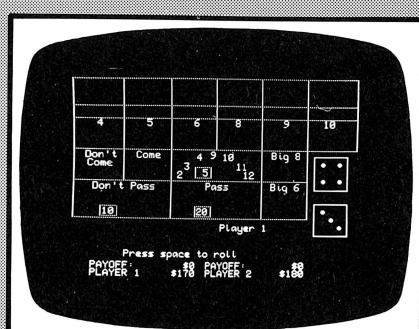
9. REVERSI



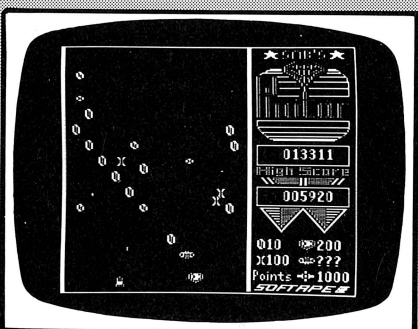
2. CROSSWORDS



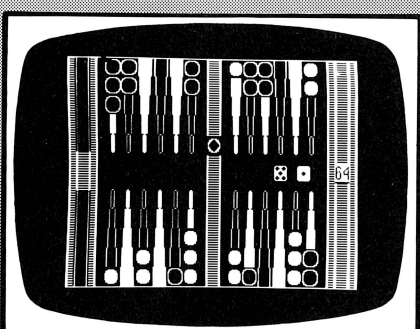
6. DRAW POKER



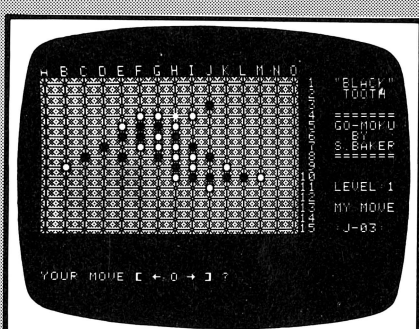
10. CRAPS



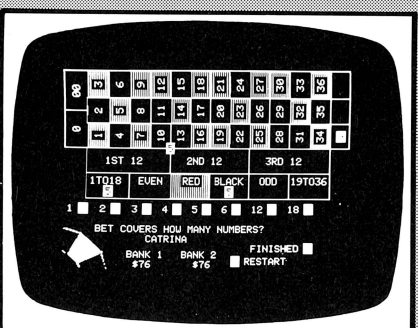
3. PHOTAR



7. MICROGAMMON II



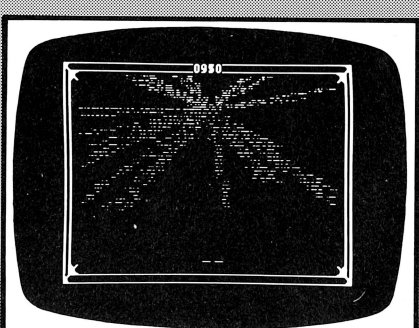
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APPLE /// INVOKABLE MODULES

by Alan Anderson

In the last issue we talked about how SOS calls are put into Assembly language programs, and how to link those Assembly language programs to Pascal programs. This issue, by popular demand, we'll reveal how to go about writing invokable modules to enhance the power of Business BASIC. The things mentioned at the end of last issue will appear next time (unless, of course, popular demand again dictates otherwise).

But First, a Word from our Sponsor . . .

Great news for all us Apple /// programming hackers. The new edition of the Standard Device Drivers Manual is out, and it's superb. It includes in-depth (and I mean in-depth) discussions of what each of the standard device drivers can do. The list of standard drivers includes .CONSOLE, .GRAFIX, .PRINTER, .RS232, and .AUDIO. The power in these drivers, particularly .CONSOLE and .GRAFIX, is incredible. The information included in this manual is extremely complete. We'll talk about some of the secrets it reveals later in this article.

The PERFORMing Arts

The ink was hardly dry on the preliminary Business BASIC Reference Manual (yep, they've upgraded that one, too) before the good old Apple II crew noticed that horrible oversight in the new BASIC: they left some things out, specifically PEEK, POKE, and CALL. To Apple II programmers, this seemed like something very close to betrayal. The PEEK, POKE, and CALL statements meant unlimited expandability for Applesoft and Integer BASIC. Anything that couldn't be done in the high-level language could be written in Assembly language and linked to the main program with these statements. Their absence from Business BASIC seemed to mean that the language was forever locked up.

Of course, that was not the case. Upon closer examination, the new BASIC had a couple of unfamiliar new statements: INVOKE and PERFORM, and the manual said something about them allowing the use of Assembly language with your BASIC programs. Hurray! But why were good old PEEK, POKE, and CALL replaced? Are INVOKE and PERFORM as powerful? How do we write assembly language programs which can be invoked, known as invokable modules?

The reason why the old Applesoft statements were replaced should be fairly obvious to anyone who read last issue's article or who is familiar with the memory organization of the Apple ///. As stated last time, the operating system (SOS) handles the odious task of loading things into memory and remembering where they are, thus freeing the programmer from such time-consuming housekeeping

chores. This makes the Apple ///'s huge memory space (128K RAM standard, expandable to 256K) into a virtual memory workspace. Whenever memory is needed for a buffer, a program, some data, or anything else, SOS automatically finds memory and allocates it. A consequence of this system, as talked about last issue, is that the programmer does not know where in memory items will be from one application to the next, so other methods of finding things must be used.

Last time we talked about the SOS call mechanism, which allows the programmer to call the operating system's routines without knowing where they reside. INVOKE and PERFORM provide a similar capability to the Business BASIC programmer. INVOKE loads one or more Assembly language routines from disk, while PERFORM executes the routines. Notice that the BASIC programmer never needs to worry about where the invokable module is when loaded into memory! This is why we don't have to worry about PEEK, POKE, and CALL. Everything that those three old friends did for us on the Apple II can be accomplished on the /// with INVOKE and PERFORM, and without the pain and hassle of wondering whether we're poking the right place, or if our recently BLOADED assembly language program has accidentally been loaded on top of DOS.

The INVOKE statement replaced BLOAD and some POKES. It automatically finds a place in memory for the desired routines, loads them and relocates them. The PERFORM statement replaces CALL, and implicitly replaces PEEK and POKE as well. It not only finds and executes the desired routine (as CALL does in the Apple II BASICs) but it also allows the programmer to pass parameters to the routine (replacing one use of POKE) and receive parameters from the routine (replacing a common use of PEEK). Also, since the programmer doesn't know where his routine has been loaded, the routine is called by name instead of by address.

The theory behind the creation of INVOKE and PERFORM is unique for a personal computer BASIC, but is by no means new. In fact, Apple borrowed it directly from another system: Apple II Pascal. Those of you familiar with that operating system, which was derived from the UCSD Pascal Operating System, know that in Apple Pascal, know that Assembly language routines can be linked to Pascal programs, that the Assembly language is loaded and relocated by the operating system automatically, and that the Assembly routines are called by name since their addresses are not known. Parameters can be passed between the Pascal program and the Assembly language routine, and the whole business uses a much nicer and cleaner interface than PEEKing, POKEing, and CALLing—ask any Pascal programmer.

If you read last issue's installment, you may remember that that article involved interfacing an Assembly language routine to an Apple /// Pascal program. The procedure and techniques we used were exactly the same as those used in Apple II Pascal. Those of you out there who are familiar with how Apple Pascal links up with Assembly language will see that the way invokable modules are created and used directly parallels the Apple Pascal technique. Therefore, I would highly recommend the Apple II Pascal Operating System Reference Manual chapter on The Assembler for some background material on writing Business BASIC invokable modules.

Getting Down to Details

Alright already, enough discussion and reference. How do I do it? Glad I asked. Well, here goes.

Assembly language routines which can be used from Business BASIC are written with the Apple /// Pascal system. In general, the code is created in the Editor, assembled with (surprise!) the Assembler, saved to disk, then used from the Basic program.

Here's a nice bonus effect of having both Pascal and BASIC served by the same operating system and disk format: the same Assembly language routine can often be used by both BASIC and Pascal with little or no modification. As a demonstration of that claim, our first BASIC

invokable module will use exactly the same Assembly language file as was used last time with Pascal, which prepares the system for a cold start. If you didn't enter the file last time, have since erased it, or (shame on you!) don't have the previous issue, I'll repeat it here, with instructions. (Back issues of the March-April 1982 issue of Apple Orchard are available.)

First, enter the Pascal Editor, and type in this file: (some of the comments have been omitted this time)

```

        .PROC RESTART
COLD_START .EQU 65          ;COLD_START's
$65                          number is
        BRK                 ;To signal a SOS
                             call
        .BYTE COLD_START    ;Tells which call
        .WORD PARAM_TABLE  ;Points to the
parameters
PARAM_TABLE.BYTE 00         ;COLD_START
params                     has no
        .END
        ;see Mar-Apr Apple
        Orchard for details

```

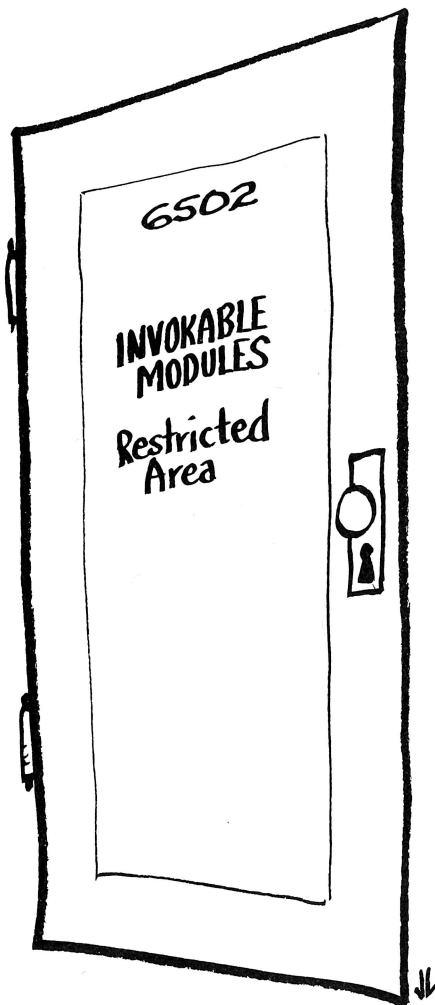
Then, leave the Editor and save the file by typing "QW.D2/RESTART", substituting a different disk drive name for .D2 if you wish. Then press "A" to assemble the file. Answer ".D2/RESTART" to the "Assemble what text?" question, using something other than .D2 if you didn't save to Drive 2 from the Editor. When asked "To what code file?", answer by typing a dollar sign. This will cause the output file to be called RESTART.CODE on the same disk as the source file. Press [RETURN] when asked for an output file name.

Once the assembly has been finished, you should have a real, live, bona fide invokable module! To prove it, boot your Business BASOC 1.1 diskette, then put the diskette with RESTART.CODE on it in the built-in disk drive. Type "INVOKE .D1/RESTART.CODE" to load the module from disk. Then type "PERFORM RESTART" and watch the fun. Your screen should say "INSERT SYSTEM DISKETTE AND REBOOT" in 40-column text mode. You've just written and executed an invokable module! That wasn't so bad, was it?

Now that you've got the basics of writing invokable modules, you should be able to handle the whole story, which appears in (ta-daa!) Apple's new technical note, Apple /// Business BASIC and its Assembly Language Interface. This note should be available from the IAC soon, or write to the author (that's me) in care of Apple Orchard for more information on writing invokables or unlocking any of the other Apple /// mysteries.

For further information: be sure and read (and reread) your Standard Device Drivers Manual. It's got great gobs of goodies in there, and it will likely answer some of your favorite technical questions about the Apple ///. Also, the Apple /// Pascal manuals are worth a perusal or two.

And now, folks, it time to practice your invocations!



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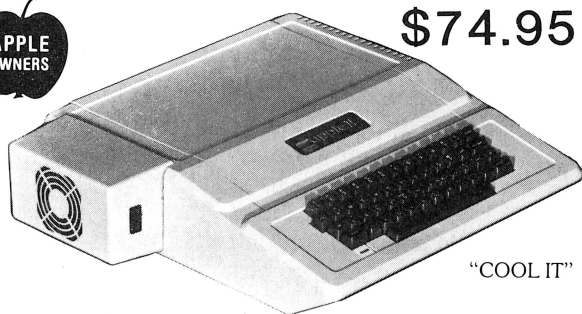
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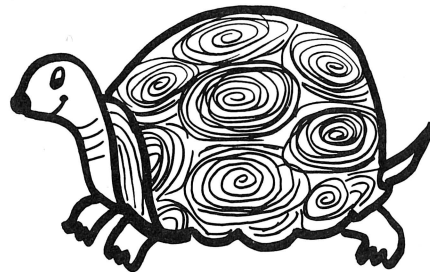
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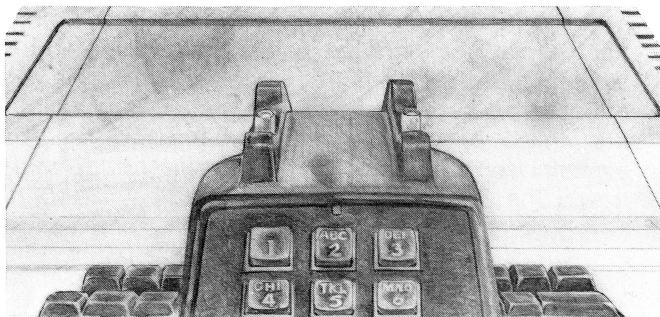
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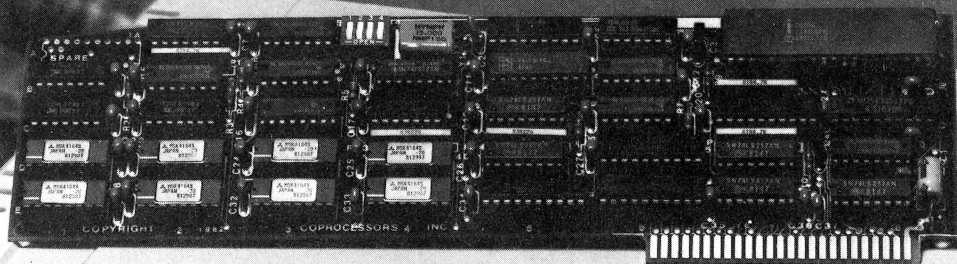
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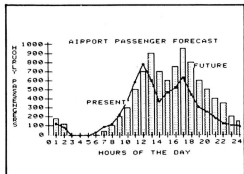
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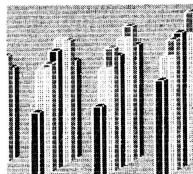
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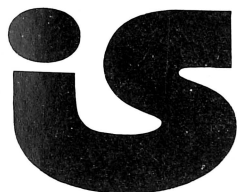
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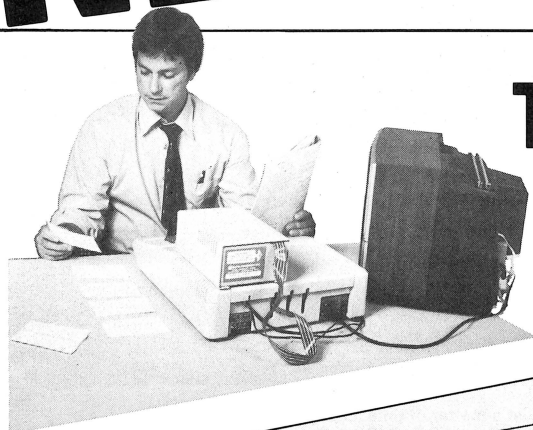
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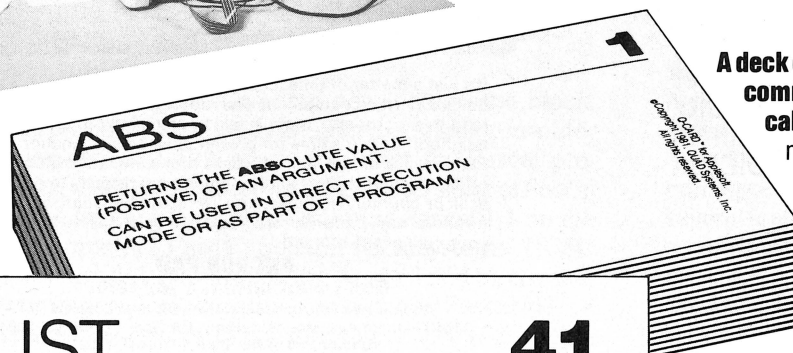
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PRINTS LINE 150

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WILL THE REAL APPLE PASCAL PLEASE STAND UP?

by Dr. Wo

Once Upon a Time, there was only one Apple computer and only one implementation of Pascal for it. Indeed, many of you would probably agree with me that there was only one personal computer and one programming language in the world! (*Note: Dr. Wo programs in Pascal. Which is a bit like saying that Carl Sagan watches stars. -PCW*)

Now, however, there are some new kids on the block. There is probably at least one other personal computer you'd love to have. But more important for Pascal programmers, there are at least four different versions of Pascal running on two Apple computers: Apple Pascal 1.1 on the Apple II; Apple /// Pascal; Softech Microsystems' UCSD Pascal Version IV.1, running on the Apple II and a passel of other computers, including the new kids, and Pascal MT, a CP/M based system covered in the March-April 1982 **Apple Orchard**.

Will the Real YOU Please Stand Up?

Now, what has this to do with you? Well, with personal computers looking more and more like appliances, in the sense that your Old Faithful Apple II may not be the only computer you'll ever own, the question is, how portable is your software? That's a valid question whether your software is purchased or home-grown.

Of course, your need for portability should be determined by your objectives. What are you trying to develop for yourself? Are you writing programs for personal use, with little expectation of acquiring another machine on which they might run? Are you developing software tools and/or applications software for your own use or for sale on the open market? Do you want those tools and applications to work on as many machines as possible, or are they Apple-specific? Are you investing a lot of your time on programs that you might like to run on another computer someday? And just how soon is "someday?"

Let's Review

We'll review three of these Pascals here and now, from two programming points of view. On the one hand, we'll look at them for developing tools for personal use, and on the other we'll look at them for developing applications programs and general purpose tools, hoping to run them on a number of machines.

Most of the review is a comparison of Apple II Pascal and Softech's Version IV. The biggest differences, and the biggest choices, are between these two. We note that there are

differences between Apple II and Apple /// Pascals, and we'll note some of these as we go along.

Apple II Pascal, Version 1.1

This is the Apple Pascal 99 per cent of us know and love so well. Omitting some history, some additions, and some revisions, it is essentially the Pascal operating system developed by Prof. Ken Bowles at the University of California San Diego (UCSD), to which Softech's Version IV also corresponds. Apple Pascal is a delight to use, and has several features which aid software development and maintenance. Whatever I have learned about good (and bad!) programming, top-down design, modular program development, you name it, I have learned on my Apple using this system.

There are additions to the UCSD standard Pascal system in the Apple implementation, the most outstanding of which is the inclusion of UNITS to aid in development of software libraries. They are *the* way to group proven, logically related data structures and procedures into a package, which can then be used in program after program. Even if you don't plan to use a set of routines in more than one program, units are still powerfully useful. They are an aid to modular development, and can save you a lot of compilation time as you iteratively debug, improve, and refine a main program. Regrettably, it took me a while to realize their value.

Four other features of the Apple operating system which I have found useful are the EXEC files, chaining, BIOS attachment utilities, and compiler options to control the residency of units and program segments. With EXEC files we can drive the operating system and our programs from a script. And with the Attach utilities (available from the International Apple Core on a disk with booklet for \$7.00) we can integrate all manner of peripherals into the operating system in a logical and consistent way.

If you have some foreign (read "non-Apple") peripherals such as a Micromodem or auxilliary RAM card and have not investigated integrating them into your system using these attach BIOS programs, you're really missing a lot of fun —and probably using a lot of kludges to drive the peripheral. The attach programs are nice because they allow you to define an Assembly language driver for a peripheral and then access it from Pascal through the operating system's I/O intrinsics. You can even pass parameters to the driver through the intrinsic "UNITSTATUS," meaning you can exercise complete control over your peripheral from

Pascal. (*The Attach BIOS material was described and augmented in the Fall 1981 Apple Orchard.*)

Well and good: now what's missing from the Apple II Pascal? Currently, a program is limited to 16 segments or units, and the System Library can contain only 16 segments. That's an effective run-time total of 32 units or segments. These limits are at least inconvenient, and oft-times more than that (!). The distinction between **regular** units, which count against a program's segment limit and must be explicitly linked to their host; and **intrinsic** units, which must be in a system library but do not have to be linked, seems arbitrary and annoying. As I develop more and more generally useful units, and use these units to break up my programs into logical pieces, I keep running up against these limits. That means a lot of library management, using this library or boot disk for one program, and that one for another, etc. I'd rather be designing and coding!

It would be very nice indeed to eliminate regular units, making all units intrinsic, and eliminating the need for linking. It would also be nice to raise the limits on both the size of the System Library and the size of programs; or to introduce a program library facility by which a program could have its own library of intrinsic-type units.

Although the EXEC feature is useful, full I-O redirection capabilities would be nicer and even more useful. What do I mean?

Consider the following situation, which leads to a question I am often asked (so there must be others who would like this feature too). You have written a program which outputs to the screen. Next, you would like to run the program and have its output directed to a printer or a disk file. In effect, you would like to pass an output file name parameter to your program when you X(ecute the program. Can you do it? No...and yes. That is, you can't pass a file name that way, but, as I'll show in a future article, you can redirect output using a trick or two to achieve a similar result. The point here is that the feature is definitely not present at the operating system level.

Finally, there are certain software tools and programming aids that only Apple the Company can provide and which I feel they should provide, even if at a (moderate) cost. I've no doubt they must have and use these tools for their own development work; after all, we have been told that Pascal is Apple's chosen in-house development language. The tools are such that only Apple can assure they will remain useful as the operating system (and the Apple II) evolves.

One such tool is the screen control unit, a unit to provide terminal independent screen operations including CLEAR SCREEN, ERASE LINE, text windowing, etc. If nothing else, such a unit would ease the problem of transporting Pascal software from Apple II to Apple ///, to IV, or whatever.

Another is a unit with routines to access and modify the system date (tied to a clock if present), the default volume name (the Prefix volume), and disk directories including file dates, wild card searches, etc. For one thing, this would grant every program that needs it the ability to list directories.

Another tool which could be provided is a unit to convert strings to integers or reals, and back again. The built-in facilities for doing this are a bit flaky, and in many cases not very friendly. (See Paul Sand's article elsewhere in this issue.) The only fail-safe way to enter numeric data now is to allow the user to enter string data, and then convert the string to the desired type. Apple the Company could help by supplying this stuff and seeing to it that the routines take advantage of how real data is represented on the host machine, including the number of bytes used to represent reals.

Apple /// Pascal

There are some significant differences between the Apple II and Apple /// Pascal systems, because Apple /// Pascal is an improvement and a strict superset of Apple II Pascal. With only a few minor modifications, like changing control character values to make MISCINFO compatible with SOS, Apple II Pascal will run on the Apple ///. Moving a program from the /// to the II, however, doesn't come as easily.

One difference is that SOS-Apple /// Pascal can maintain hierarchical directories. The Apple II cannot, of course, and any programs which rely on this feature will not be portable.

A major strength of the Pascal language is the ability and requirement to classify variables by types. All variables must be declared to be of a type, and that identification specifies its permissible values and the operations that can be performed with it. Unfortunately, this strength turns out to be a hindrance when trying to develop libraries of general procedures to operate on arrays. Apple /// Pascal has provided a partial solution to this dilemma with the inclusion of two new datatypes, "bytestream" and "wordstream," which can be used to type variable parameters in procedures.

To illustrate, consider the following Apple /// example:

PROGRAM example;

VAR

a : ARRAY[1..100] OF INTEGER;

b : ARRAY[25..74] OF INTEGER;

FUNCTION sum (VAR data : wordstream;
n : integer) : INTEGER;

VAR

x, i : INTEGER;

BEGIN

x : 0

FOR i : 0 to n DO x : x data[i];

sum : x;

END;

BEGIN

Writeln (sum (a, 100));

Writeln (sum (b, 50));

END.

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In this example, one function serves to sum the elements in arrays of different types. This is not possible in Apple II Pascal, so any programs on the Apple /// would have to be modified for use on the II.

A third difference between the Pascals is the larger number of effective segments allowed in the Apple /// program. Each such program is permitted 16 segments or regular units, 16 units from the System Library, and 16 intrinsic units from a program library for a total of 48 segments or units! If you get accustomed to this feature, you will have trouble moving your programs to an Apple II.

One way to solve potential portability problems is to program to the lowest common denominator; to not use the "new" features of the more powerful machines. Another way is to abandon the Apple II entirely; after all, you probably sold it to get the money to buy the ///, right? Better, in my opinion, would be to implement these features for the II. (C'mon, guys, you can do it!) And while we're at it, why not kick in a type "realstream," or better yet, conformant arrays, the generalization of these "streams."

Some of my friends rather strongly disagree with me here. They like what they have on the II, and aren't interested in seeing it changed. You may agree with them. In fact, you may not care at all. Again, it depends on you and your goals.

UCSD Pascal, Version IV

Where do I begin? Get this:

In General:

- * Compiler option selectable native code generation;
- * Double precision real arithmetic;
- * An enhanced System Editor including "tabstop," "exchange delete," and "exchange insert" commands;
- * Complete freedom to redirect program and system I-O from the X(ecute command line and from within programs;
- * Up to 256 units or segments per program, all units intrinsic, no linking;
- * A program's units can reside in any library;
- * Every library has room for 256 units;
- * File variables allowed in the interface section of units, segment procedures allowed in the implementation section (not possible in the Apple Pascals);
- * Units can use other units in their implementation section as well as in their interface;
- * Turtlegraphics. Not source code compatible with Apple's.
- * Chaining;
- * A "screenops" unit to control the screen, including access to the system date;





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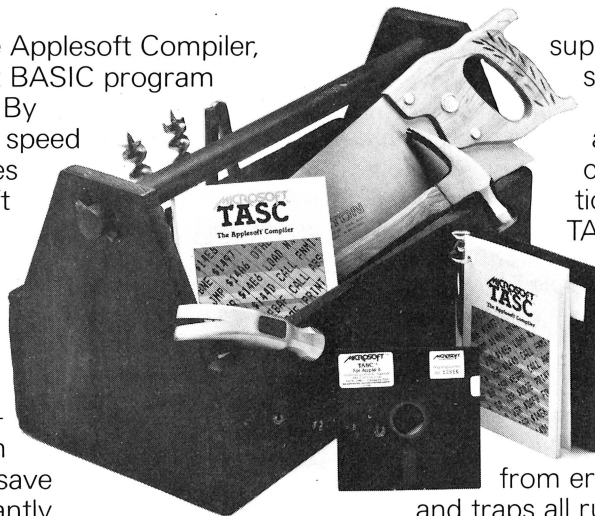
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TASC will compile and run larger programs than any other Applesoft Compiler. As a disk-based system, it doesn't require the simultaneous presence of compiler and program in memory. The memory you save allows you to compile significantly bigger programs.

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supports several programs in a single runtime environment.

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CONSUMER PRODUCTS

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- * An interactive, symbolic debugger;
- * Full support of duplicate directories, including "markdupdir," "copydupdir," and "recover" programs (*See Dr. Wo's column in the Winter 1981 Apple Orchard. -PCW*)
- * Various other utilities including a P-code disassembler and the famed "patch" program, a byte-level editor;
- * BIOS attachment utilities;
- * Primitives for concurrent processing and interrupt handling;
- * A variety of new memory management procedures which should facilitate development of routines for processing arrays;
- * Memory management procedures for controlling the residency of segments and units under program, as opposed to compiler, control;
- * Extended system memory management so that application programs can make use of the larger memories in the coming computers;

And...

- * Complete portability of software between the Apple II, Z-80 machines, the IBM-PC, 68000-based machines, 6809 machines, TI 9900 machines, LSI-11/PDP-11, ...and others.

Specific to the Apple II

- * Drivers included for a variety of peripherals, including all of the standard Apple ones and Micro-Sci floppies, SVA 8-inch floppy disk controller, lower case adapters, CCS serial card, SSM AIO serial card and Sup'R'Term, Smartterm, Videx, and Double Vision boards;
- * A completely relinkable BIOS which allows you to take advantage of the above-mentioned drivers;
- * A configuration utility which allows you to set such parameters as whether you have installed a jumper to enable true shift key operation from the Apple II keyboard.

Going Down

I like this system. I like it a whole lot. But it's not the best system if all you'll work with is the Apple II; it works better on other computers. What's the down side?

The Version IV system is noticeably slower on the Apple II than is Apple Pascal. This is because the system architecture is quite different and because the system is heavily swapped, leading to more disk I-O than with Apple Pascal.

This system will be very hard to use with only (!) two disk drives, not only because of the swapping mentioned above, but also because the SYSTEM.PASCAL file is much larger than the Apple Pascal version. The score is UCSD 84 blocks without debugger, Apple 41 blocks. So there's less space on the boot disk.

Consider this: the System Filer is now segmented; not all of it resides in memory at once. You will swap disks while using the Filer, even on a two-drive system. This can be tricky, or inconvenient, or both.

The Version IV system as marketed by Softech sells for \$750 (not including the RAM card), which is more than Apple Pascal. Surprised? Don't be. Remember, Apple the Company sells hardware, and software to sell hardware; Softech sells...software. We also don't know the details of the licensing agreements with the Regents of UC, etc. The price difference is substantial. So are the differences between the operating systems. Which system is for you? I can't answer that question for you, but I can answer it for myself.

Let's suppose I was an experienced BASIC programmer, had an Apple II with two floppy drives, and was about to purchase Pascal for the first time. The choice is Apple Pascal hands down; there's plenty of room to grow into this system and to learn some very exciting things.

Now suppose I was an advanced hobbyist; a reasonably experienced Apple Pascal programmer looking forward to upgrading my system by hanging on an 8086 processor with 128K RAM on board, and a mini-Winchester hard disk. I don't know that I'd rush out and get Softech's Pascal, or the CP/M MT+ discussed in the March-April 1982 **Apple Orchard**, but I sure would be wondering who is going to bring up Pascal on my new processor and how, and what version they plan on using. I'd hope for the best: both operating systems making full use of my new computer's capabilities.

Or, suppose I was a cottage industrialist, developing applications software and hoping to reach the broadest possible customer base in the shortest time. Softech's Pascal would be worth having; sitting in front of my Apple, I could write programs for any number of machines, availing myself of all of the powerful features of the new operating system. I would use Apple Pascal, or the appropriate subset of it in Softech, when trying to reach the Apple market specifically. Apple's Pascal is faster, as it's tailored for the Apple machines.

Finally, let's say I was trying to write software for tomorrow's computers today. Choice: Softech, going away. New machines will be far better equipped for emulating the P-machine than today's Apple II, and will obviate the downside analysis given above.

Who are You?

The whole point is, that there is a tradeoff analysis which you must make. Maybe you're a cynic who believes that new machines won't be logically thought out in terms of P-machine capability (*History is on the side of the cynic, as usual. -PCW*) Well, on one end of the spectrum is portability, on the other is the speed and smoothness that comes from custom-tailoring to the machine architecture. Only you can say.

Indeed, what have you to say? what are your interests and objectives? If you'll let me know, I'll try to point my pen...er, keyboard, in your direction.

President's Message

Ken Silverman
President, International Apple Core

One of the questions most often asked by Apple owners and Apple User Groups is, "What is the International Apple Core and what can it do for me?" We try to answer this question in this space every so often, so here goes:

The International Apple Core (IAC) is a non-profit organization composed of Apple computer User Groups throughout the world. It was formed to disseminate all types of information from Clubs, Apple Computer, Inc., and other manufacturers of related hardware and software; this includes written information and public domain software. Of course, we publish the **Apple Orchard**, and all of our memberships include a subscription. Only the Full and Sponsoring members receive the software in addition to the written information, usually one disk per month; Associate members receive only the written information.

The IAC's policies are set by a Board of Directors that at this time has eight members from the United States (two from each of four regions); and a member each from Canada, Europe, and Australia. A full list appears on Page 4 of this magazine. The IAC, what it is, what it does, and how it does it, is directly set up by the member groups through this mechanism. You can get more detailed information by contacting the Direc-

tor in your area. Note too that an application blank appears in this magazine.

Full Membership

Full membership is open to clubs (groups), and not to individuals; we represent the individual user through the Clubs. The Clubs are the principal reason for the IAC's existence, and we provide many services beyond information dissemination. There is a Newsletter Exchange co-ordinator for swapping of publications between clubs. The Software Librarian collects and disseminates public domain software. We support Special Interest Groups, and the Clubs' efforts at same; examples are Education, Ham Radio, Handicapped Persons, Medical.

Only Full members may nominate and vote on directorships, and vote on other issues pertinent to the business of the IAC. Membership is open to all Clubs, if those Clubs have an open membership policy. Annual dues are \$50.00 (US) per year.

Sponsors

Manufacturers and other software companies having business related to Apple computers need timely access

to information that the IAC distributes. Conversely, the IAC's members all benefit from the input provided by sponsors; we encourage such participation.

The Sponsoring membership is tailored for commercial interests; quite frankly, the higher dues also help the IAC's financial condition. Sponsoring membership is open to all corporations and individuals who wish it. The annual membership fee is \$200 per year.

Associate Memberships

The Associate Membership was created to help educational, research, and charitable institutions that have an interest in Apple Computers. Associate members receive *only* the printed materials sent to members, and have no vote in business matters. Associates are encouraged to give us input, and to organize a Club which would be eligible for Full membership.

Further information on Associate membership eligibility and criteria will be supplied upon submission of an application. Associate Membership is free.

Whatever the membership category, we encourage your participation in the IAC, and better relationships between people and their Apples everywhere.



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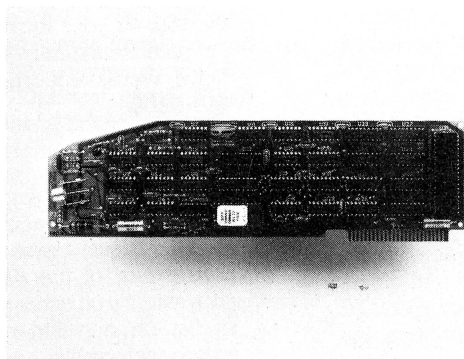
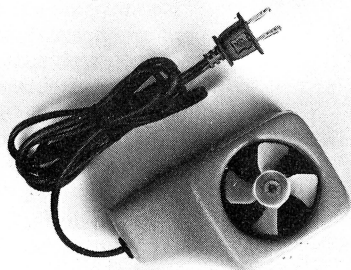
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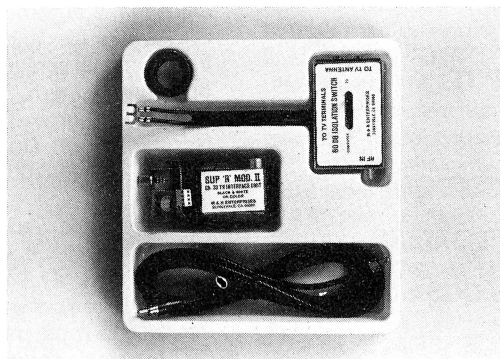
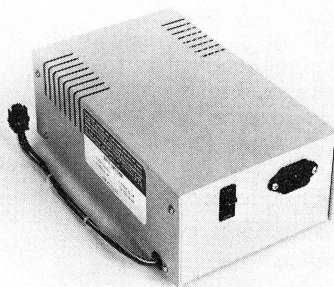
- 80 Columns by 24 lines, upper and lower case; all 128 ASCII characters
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*Version 2.5

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- Mounts on left side of Apple II
- Sufficient current to handle all 8 slots
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SUP'R'MOD II

The SUP'R'MOD II is a wide band black and white or color compatible interface system intended to convert the home TV to a full video display for home computers, CCTV cameras and similar systems which output NTSC compatible composite video. The SUP'R'MOD II is pre-tuned to U.S. channel 33 (UHF), includes a coaxial cable and antenna transformer, and in conjunction with a standard home TV set, insures safe isolation and high performance.

SYMBOL	DESCRIPTION	TYPICAL	UNIT
F _c	Vision Carrier	591.5	MHz ± 0.5
I _{cc}	Supply Current	2.0	Ma
VO (Hi)	RF Output, V _{mod} = 0	1.5	Mv
VO (Low)	RF Output, V _{mod} = 1.5	-20.0	dB
R _{in(mod)}	Modulation input resistance	700.0	Ohm
V _{osc (Min)}	Oscillator stop voltage	2.0	Volt
V _c	Voltage	+5 to +12	Volts DC

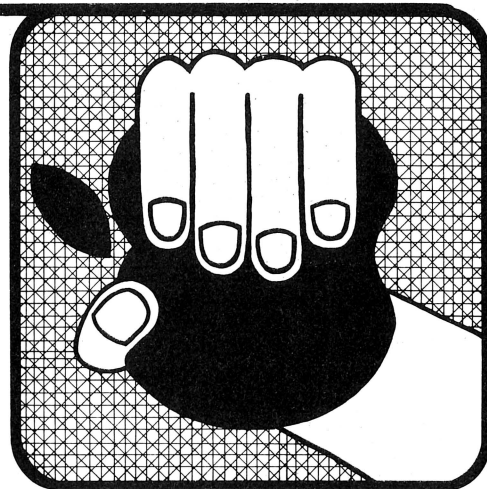


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Forbidden Fruit

NEW PRODUCTS FOR THE APPLE

Edited by
Mark L. Crosby



Producers of hardware and software for the Apple line of computers should send news releases 3 months in advance to NEW PRODUCTS EDITOR, Apple Orchard, 910A George St., Santa Clara, CA 95050. The IAC cannot be held responsible for claims made by manufacturers.

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Hardware

INPUT/OUTPUT

The Corona Starfire 5 is a 5 megabyte Winchester disk drive. It holds the equivalent of 38 diskettes of data which is available instantly, and it can alphabetize a mailing list 5 to 10 times faster. Includes DataGuard automatic data protection. Allows your files to be twice as long, beating a crucial limitation of Apple's disc operating system, without abandoning it—\$2,995. Corona Data Systems, 21541 Nordhoff Street, Unit B, Chatsworth, CA 91311 (213) 998-0505.

Programmable Serial I/O Board is fully compatible with current Apple software including Pascal 1.1, Applesoft and Integer BASIC. It provides a full EIA RS-232 DTE interface to most modems, printers and CRT terminals as well as an opto-isolated current loop interface strappable for full or half duplex, active or passive 2-wire or 4-wire, 20mA or 60mA operation up to 200V. On board 1K ROM software enables user programmable printer width control, delay after carriage return, automatic line-feed generation, and video display. Serial character format is user alterable with the most popular configurations set as default conditions. Provides a full range of continuously variable, programmable asynchronous data rates to 19.2 K baud; automatic recognition of the incoming data rate from a remote terminal; and firmware routines to pulse-dial calls onto the international Telex-TWX network—\$199.95. Intra Computer, 120-10 Audley Street, Kew Gardens, NY 11415 (212) 947-5533.

Microbuffer II lets you use your printer without tying up your computer. It has 16K characters of memory (user expandable to 32K). It accepts data as fast as your computer can send it, allowing you to use your computer while the Microbuffer II is

in control of your printing. The Microbuffer II, compatible with Applesoft, CP/M and Pascal, comes with complete print formatting features as well as advanced graphics dump routines for most popular graphics printers. The Snapshot option permits you to dump the text screen or graphics picture to the printer while any program is running—without interruption. The 16K Microbuffer is available for \$259, the 32K version for \$299 and the Snapshot option for \$69. At your local dealer or contact: Practical Peripherals, Inc., 31245 La Brea Drive, Westlake Village, CA 91362 (213) 991-8200.

Select-A-Port plugs directly into your game socket giving you access you never had before. Attractive case matches the color and texture of the Apple II. May hang conveniently on either side of the Apple or sit flat on non-skid rubber feet. Three switch selectable sockets isolated by diodes to insure against device to device interference. One switch selectable socket which automatically modifies the joystick or paddles to operate as the second unit in dual joystick games of four game paddle games. One socket with no isolation for those special highly sensitive devices—\$59.95 plus \$2 for postage and insurance. TG Products, PO Box 2931, Richardson, TX 75080 (214) 424-8556.

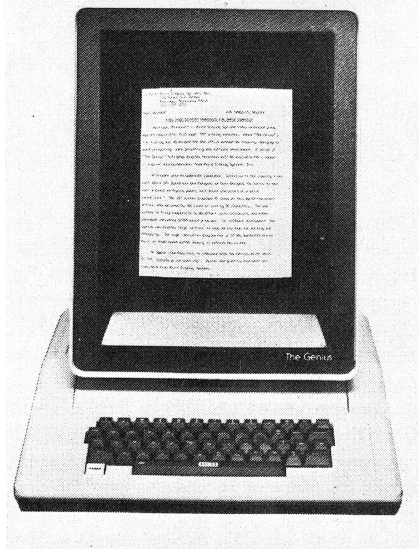
The Station Master is a universal parallel card with the added capability of being able to put the Hi-Res screen on paper with simple keyboard commands. The Station Master may be used with any one of four different printer types (Epson MX-80 w/graphics, MX-100, Anadex 9501/9500, Data South DS 180, Centronics 739, NEC PC8023). There are options for dumping Page One or Page Two, normal or expanded size, picture or plot, and horizontal positioning. Supplied with printer cable so you just plug in and go. We also include a diskette with practice pictures and plots as

well as drivers for use with VisiPlot. Compatible with BASIC, Pascal 1.1, CP/M and application software. The documentation includes helpful information for first-time users about Hi-Res graphics and how to use the board with programs such as Applewriter, Apple Plot, VisiCalc, and VisiPlot—\$175. Computer Station, 11610 Page Service Drive, St. Louis, MO 63141 (314) 432-7019.

5/10 Megabyte Hard Disk Drive for the Apple runs DOS 3.3, SOS 1.1, Pascal, all CP/M programs, plus DB Master, CompuLaw, Accounting Plus, Peachtree Accounting, SuperCalc, Medical Management, Stockbroker, Real Estate Manager, Word Star, and Farmplan. Unique Error Correction Coding (ECC) gives you an internal hard disk backup system, so media errors are corrected and become transparent to your computer. These advantages assure you of reliable performance for years to come: 10,000 hours MTBF, no preventive maintenance, 2 hours MTTR, expandable through daisy chaining. Santa Clara Systems, Inc., 560 Division Street, Campbell, CA 95008 (408) 374-6972.

From **Amdek** comes a new **RGB color monitor** with TTL input for high resolution graphics. Features 80 x 24 character display capability, 560 x 260 resolution, molded-in carrying handle, front mounted controls, including volume control for built-in speaker. Optional Digital Video Multiplexor peripheral board for interface with the Apple II signal. The DVM consists of a 4-channel multiplexor. Three channels are used to multiplex the existing Apple text, low resolution and high resolution graphics. The 4th channel allows the use of an 80 character line video board such as the Vydec VideoTerm. It is Software programmable allowing each of the three channels to be turned off or on. Occupies any slot in the Apple II. Uses Schottky logic with low power consumption. Amdek Corporation, 2420 E. Oakton Street, Suite "E", Arlington Heights, IL 60005 (312) 364-1180.

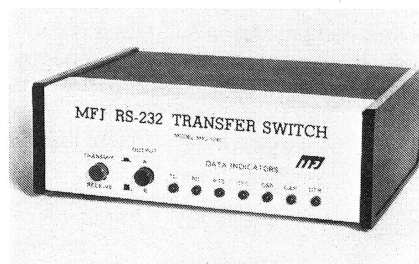
The Enhancer II for the Apple II provides you with a true upper and lower case keyboard with fully functional shift keys. Single keystrokes can be defined to become an entire word or phrase. The typehead buffer allows you to talk to your Apple II while it's busy with other things. The Enhancer is controlled by its own built-in microprocessor and on-board firmware. Provides 1K static RAM using low power CMOS technology. Control-Reset is available as a jumper-selected option. Key redefinitions are down loadable from disc. Automatic repeat gives you approximately 15 characters per second, while fast repeat does it at 50 characters per second. Requires a revision 7 or greater motherboard to display lower case—\$149. At your local dealer or contact: Videx, 897 N.W. Grant Ave., Corvallis, OR 97330 (503) 758-0521.



The Genius displays a full page—57 or 66 lines of text by 80 characters across and was developed for the office automation industry, applying to word processing, data processing and software development. The 15-inch CRT reformats during editing at a fraction of a millisecond, rather than the slow sequential updating on most CRTs. Display of information from memory to screen is also instantaneous as well as sending information from screen to storage. The high-resolution screen with black characters on white provides the necessary requirements for reducing typical CRT eyestrain and fatigue. The new Genius is fully compatible with WordStar (with SoftCard), and other packages including most CP/M based programs. The 34 pound display has an 87 MHz bandwidth and 6K bytes of high-speed buffer memory to refresh the screen. The Genius is 18¾ inches high by 12 inches wide by 16 inches deep. An Apple interface card is standard with The Genius, which costs about \$1,795 (single quantity price). Quantity and dealer discounts are available from Micro Display Systems, 514 Vermillion Street, Hastings, MN 55033 (612) 437-2233.

The new and revolutionary **Aristocard 68000** will endow your Apple II with the lightning speed and super features of a minicomputer, for a mere fraction of the cost. Aristocard 68000 will help you learn the highly efficient Assembler without the difficulties and complexities associated with other microprocessors. Uses a 32-bit internal structure. The menu driven Assembler is designed to teach programming on the 68000 quickly and efficiently. When the 68000 is running it is possible to execute programs on the Apple's 6502 simultaneously, which is achieved by a cycle stealing technique which allows the

6502 to operate at a 30% decrease in speed. Optionally, the 68000 can be halted resuming normal 6502 speed. Check locally or contact: Simon, 28 Lower Addiscombe Road, Croydon, Surrey, CR 06 AA, England (01) 690-4646.



This new **Transfer Switch** lets you switch from one RS-232 peripheral to another without the downtime, frustration and expense of moving RS-232 cables. Individual LEDs let you see at a glance which lines are transmitting. A convenient push button switches any input to either of 2 outputs. It also has a push button reversing switch to let you change from transmit to receive without touching a wire. It has three standard RS-232 25 pin D connector sockets—one input and 2 outputs. The Model MFJ-1240 switches ten of the standard RS-232 lines—more than is needed by most small computer systems. Switched lines are TD, RD, RTS, CTS, DSR, CAR, unassigned, XMIT CL, REC CI, and DRT. PC board construction eliminates crosstalk and noise caused by wiring. The cabinet is eggshell white with walnut grain sides and measures 7¼ x 2½ x 5¾—\$79.95 plus \$4 shipping and handling. MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762 (601) 323-5869.

The Grappler intelligent graphics interface takes simple commands from the keyboard or user programs and dumps Hi-Res graphics to your printer. Exclusive EPROM chip makes it easy. There are Grappler versions to accommodate the Anadex, Epson Series, IDS, Centronics 739, NEC 8023, C. Itoh Pro-Writer, Okidata 82A, Malibu 200, and future graphic printers. Features inverse graphics, double size picture, 90 degree rotation, centering, chart recorder mode, mode block graphics, bell control, skip-over-perforation, left and right margins, variable line length, text screen dump. Works with Pascal and CP/M as well as Integer and Applesoft. See your local dealer or contact: Orange Micro, Inc., 3150 E. La Palma, Suite G, Anaheim, CA 92806 (800) 854-8275 in CA call (714) 630-3322.

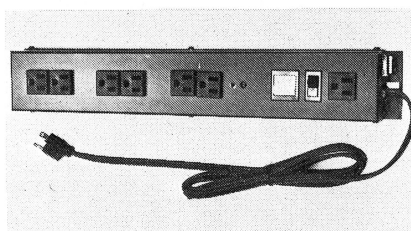
The UPBUS personal portable Apple terminal, with built-in display monitor, lets you operate your Apple II anywhere—in your car or camper, at the beach, wherever. Built-in batteries provide approximately two hours of operation—without A.C. power available. For longer operation,

an external twelve volt battery can be used. Built-in five inch monitor, rechargeable, long life SLA batteries for operating your computer, floppy disk and monitor display. Adapter for car battery operation, automatic switchover to battery power if A.C. power fails or is unavailable. Automatic battery recharge when A.C. power is available. Chassis accommodates your floppy disk. Operates from 110/220 VAC or 12VDC—\$595. UPBUS, 7825 East Evans Road, Building 300, Scottsdale, AZ 85260 (602) 991-7356.

MEMORY

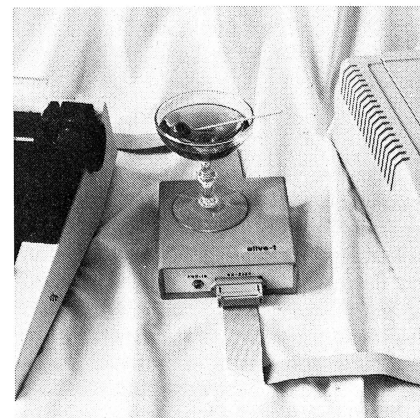
The Axlon 320K memory System is designed to interact with Apple DOS 3.3 and Apple Pascal 1.1 like two standard floppy disk drives while delivering the lighting fast access speeds of RAM memory. This also leaves 32K of RAM for advanced programming techniques. The interface board is slot independent and draws no power from your Apple. The rechargeable battery system built into the unit provides three hours of backup in the event of a power loss. Invisible memory refresh—even with the Apple turned off. All firmware is in static RAM on the interface board. Includes software for diagnostic, fast load and copy routines, and business applications. Axlon, 170 N. Wolfe Road, Sunnyvale, CA 94086 (408) 730-0216.

POWER CONDITIONING



Commercial quality power center features a sensitive protective relay. Momentary power line off-on transients cause this relay to latch out power before damage to disks and equipment can occur. A lighted reset switch restores power when you are ready so you can control your power-up sequence. Individual RFI pi filters isolate from the other pairs of sockets. Interaction between printers, processors, floppies and other equipment is eliminated. Varistors between each line and ground and between lines suppress voltage spikes that can cause memory loss, erratic operation and equipment damage. A six foot heavy duty three wire power cord and industrial grade grounded sockets assure years of safe and trouble-free use. It is protected by a fast acting, easy access, popout fuse (15A, 115 VAC—1875 Watts Max.)—\$99.95 plus \$4 shipping and handling. MFJ Enterprises, Inc., P.O. Box 494, Mississippi State, MS 39762 (800) 647-1800 in MS call (601) 323-5869.

PRINTERS/PLOTTERS



The Model OLIVE-1 Olivetti Interface turns the Olivetti Praxis-30 or -50 electronic daisy wheel typewriter into a letter quality printer with RS-232C computer interface. The interface provides a wide range of user options, such as baud rate, handshake protocol and special function selection; all functions of the typewriter are controllable from the host computer. Typewriter features interchangeable daisy wheel (100 characters) and ribbon cartridge, selectable character pitch, selectable print inpace, friction platen drive with 11 inch maximum print width, fully programmable margin and tab control, 12 characters per second printing speed. The interface is completely assembled and tested with interface cables and detailed instructions for attachment to Praxis-3X, typewriter function unimpaired, priced below \$200; 9 VDC/300mA wall socket plug-in power supply optional. Model OLIVE-80 printer package, including Praxis-30 and OLIVE-1 Interface plus full documentation, priced below \$700, package with Praxis-35 slightly higher. The Olive Branch Association, Ltd., 1426 W. Winton Ave., Hayward, CA 94545 (415) 887-4716.

Starwriter F-10 low profile unit is the answer for the perfect daisy wheel printer, including such features as: low profile design (16" high) to fit easily into your system, industry-standard ribbon cartridge, 40 or 55 cps models, standard parallel or RS232-C interface (including ETX/ACK, X-On/S-Off) protocols, extensive built-in word processing functions that allow easy adaptability, uses plastic or metal wheels, low noise operation. A choice of friction feed or optional bidirectional tractor feed is available. Leading Edge Products, 225 Turnpike Street, Canton, MA 02021 (800) 343-6833 in MA call (617) 828-8150.

The Pro-Writer Matrix Printer includes 120 cps bidirectional printing, logic seek-



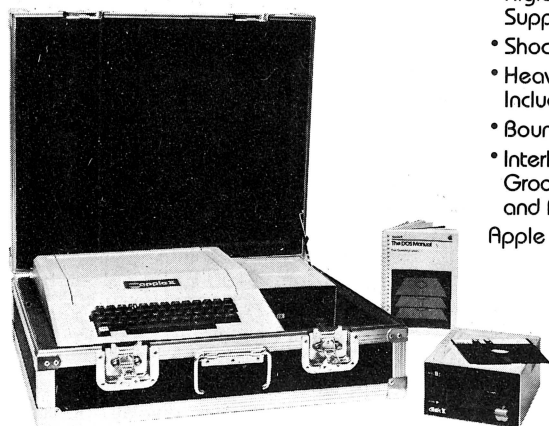
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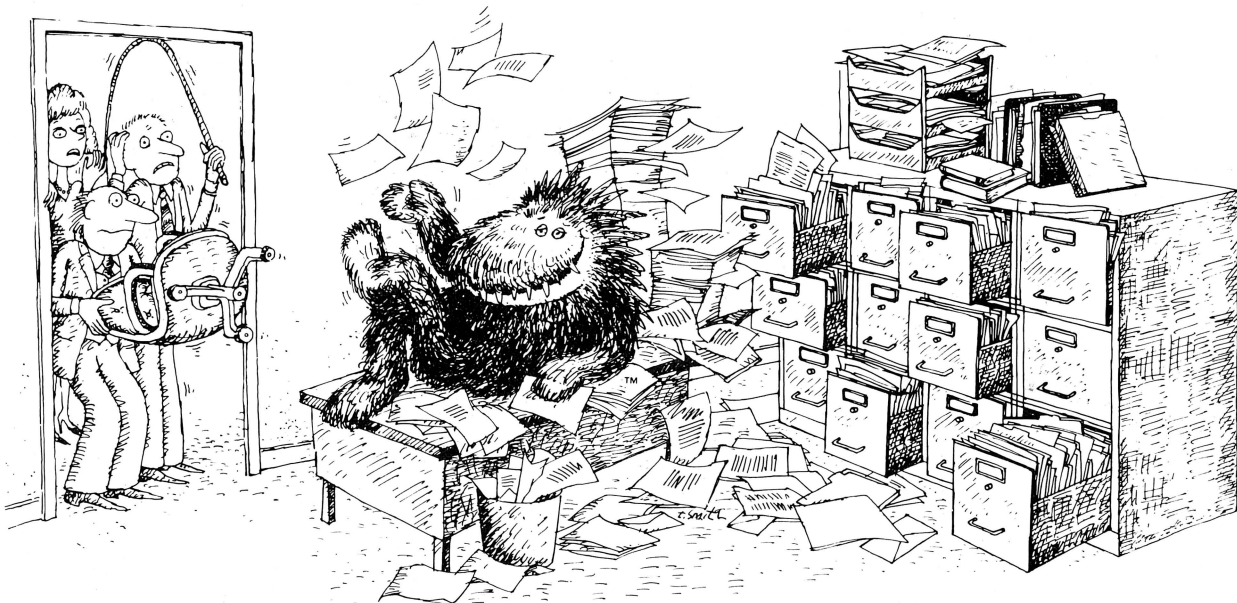
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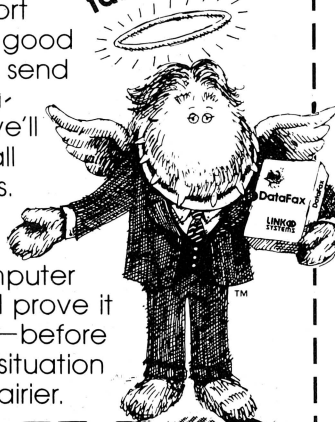
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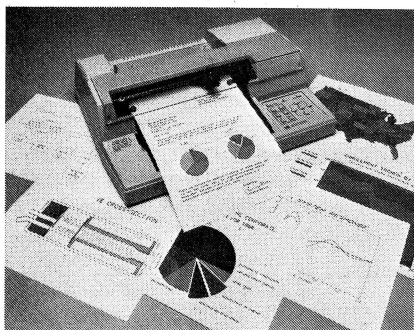
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ing and proportional spacing combined with excellent resolution. Graphics capability is built-in and includes shape and high resolution features. The Pro-Writer boasts of its 1K buffer in parallel and 3K buffer in serial, increment printing ability, N x 9 dot matrix, and its correspondence quality print in eight character sizes. Built-in tractor feed and will accept single-sheet feed. Its paper cut-off is less than one inch from the print line. Vertical and horizontal tabbing is automatic and with the use of a stepper motor, the Pro-Writer is very quiet. Manual functions include select, line feed, Top of Form and Power On, combined with Paper Empty and Cover Open Switches. The serial version actually includes both the parallel and serial interfaces. Parallel model—\$795, Serial model—\$845. Leading Edge Products, 225 Turnpike Street, Canton, MA 02021 (800) 343-6833 in MA call (617) 828-8150.



The microprocessor-based **HP 7470** intelligent small-format pen plotter features two-color capability, high-resolution plotting (+/- .025mm) and a rapid plotting speed of 15 inches/second (38 cm/sec) to produce graphics of exceptional quality. Can be used with Apple, IBM, and Commodore Pet. Can be connected to laboratory instruments such as the HP 1980 oscilloscope, spectrum analyzers and other HP instruments to produce hard-copy versions of measurement graphics. Pen acceleration of 2 G's and pen-down velocity of 38 cm/sec to a pen-up velocity of 50 cm/sec allow even complex plots to be completed in a matter of minutes. Built-in character generation, with European character set, vector plotting and internal line-types. The unit can automatically reconfigure or scale a graphic or character to fit within a certain area—condensing, expanding enlarging and reducing all images and characters. Equipped with one of two standard interfaces: HP-IB (IEEE-488) and RS-232C. Call your local Hewlett-Packard sales office.

The **Transtar Model 140** daisy wheel printer provides high quality, fully formed character printing capabilities in a compact, low profile package. Microprocessor-based design allows emulation of an industry standard specialty printer protocol, providing compatibility with existing



driver routines of established word processing software, such as Peachtree's Magic Wand and MicroPro's WordStar. The serial interface, with front panel-mounted, DIP-switch selected communication rates to 2400 baud, supports the commonly used DTR busy protocol as standard. An optional bidirectional tractor allows use of a wide variety of fanfold forms, and provides precise vertical alignment for the accurate printing of superscripts, subscripts, and graphics—\$1,695. Micro Distributors, 11794 Parklawn Drive, Rockville, MD 20852 (800) 638-6621 or Sigma Distributing, 2110-116th Avenue N.E., Bellevue, WA 98005 (800) 426-1412.

MISCELLANEOUS

New **Dual channel, DC to 50 MHz digital memory Oscilloscope** fits as a module into Apple II and Apple II Plus microcomputers, using the display and keyboard as an oscilloscope screen and control panel, the Apple computer for waveform processing, and disk memory for waveform storage. The Model 85 performs standard laboratory functions such as signal averaging and DVM readout, and 8K of Apple memory is available for user program development. User programmable for such functions as Fast Fourier Transform, auto- and cross-correlation, power density spectra, and integration and differentiation. The Model 85 acquires data through probes or cables connected to the module at the back of the computer. Fastest sweep speed is 10ns/div, and, at 1 ms/div and slower, the scope operates as a real-time A/D conversion system. Software-generated 8 x 10 division graticule (erasable for an easier-to-read display, and, since it is on precisely the same surface as the waveforms, introduces no parallax or distortion errors. A cursor provides DVM readout for any specified point on a displayed waveform. Supports hard copy output of the waveform display (Silentype or Epson MX-80) to which the user may add comments if desired—\$995. Requires two peripheral slots, 48K and one disk drive with DOS 3.3. Northwest Instrument Systems, Inc., P.O. Box 1309, Beaverton, OR 97075 (503) 297-1434.

The **Kanel A2-1 Logic Analyzer** is a peripheral card for the Apple computer that can analyze TTL compatible MOS and TTL circuits. Connected to the card's three ribbon cables are 32 data input probes and 16 data output probes. Software sup-

plied displays input signals as columns of 1's and 0's on the screen. From 1 to 16 of the inputs may be used for a trigger pattern. Routines are provided in BASIC, Pascal and assembly language to help the user to write custom programs for programmed stimulus/response interaction with the circuit under test—\$400. Kanel Corp., 1025 Reynolds Road B202, Johnson City, NY 13790.

The **Model T Computer Slide System** produces color slides using a 48K Apple and graphics tablet. The output of the system is common 35mm Ektachrome film that can be developed in 38 minutes. The slides cost an average of \$3 each to produce and are sold on the open market for \$10 to \$20. The Model T has 20 character fonts, each in several sizes. No programming is necessary to create slides since it is largely created through prompts. The cost of the add-on to an existing Apple is \$3,495, which includes the reproduction module, software and graphics tablet overlay. The reproduction module has a motorized 35mm camera controlled by the computer. Requires an Apple II Plus with 48K, Apple Graphics Tablet, DOS 3.3 with two disk drives and a color video display. Toucan Visual Production Systems, 1033 Battery Street, San Francisco, CA 94111 (415) 392-2970.

The **Soundchaser Digital/Analog Music System**, designed for the Mountain Computer Music 5, is a professional 49-key four octave unit. Superb "touch", housed in a handcrafted solid wood cabinet. The **Analog System** consists of the keyboard and interface card, Passport Designs Analog Voice cards, and the Music Operating System software. Features a three-voice analog card with state of the art components. Oscillator, filter and amplifier are computer controlled; one card may be used for up to six voices. Software provides advanced sonic control, allowing you to draw contours and modify waveform shapes as never before. Sequencer section lets you lay down bass lines or chords while you play over them.—\$560. The **Digital System** consists of the keyboard and interface card, the Mountain Computer, Inc. Music System and the Soundchaser Digital performance software. Each of the eight voices in the hardware system uses two independently programmed and controlled digital oscillators. The software lets you define the "instruments" or presets by drawing the waveforms or by specifying their harmonic content. Ten presets in memory can be changed "on the fly" with no delay. An outstanding feature is the multi-track sequencer, which can store and play back entire orchestral arrangements. The sequencer is fully polyphonic.—\$520. Passport Designs, Inc. 785 Main St., Half Moon Bay, CA 94019. (415) 726-0280.

Software

BUSINESS

The VersaForm Business Forms Processor will boost your paper forms productivity on the apple II. A business forms processor is a sophisticated yet simple to use transaction management program. The central feature of such a program is its ability to process multiple transactions under a single heading. This is unique among all existing data or file management programs currently available on low-cost microcomputers. Instantaneous updating within a specified form yields running totals, cumulative tax or tariff charges, and correctly calculated sub-total extension by line. Once the information has been entered and processed, it can be sent back to a pre-printed form or blank paper that becomes its own form. Management reports can easily be produced summarizing information from the completed forms. Applied Software Technology, 15985 Greenwood Road, Monte Sereno, CA 95030 (408) 395-1541.

EASy, the Executive Accounting System for the Apple /// is a comprehensive accounting program with general ledger, accounts receivable, and accounts payable modules. Fully integrated, and designed for small- to medium-sized businesses requiring full reporting capabilities, maximum friendliness, and expandability. Generates complete financial and management reports. Prints invoices, statements and checks. Entirely menu-driven, multiple company use, expandable with add-on modules, partial and manual payments, flexible accounting periods, fast access to information. On 5 1/4 floppies upgradable to Profile Hard Disk. No price given. At your local dealer.

With **VC-Manager**, you can add, subtract, divide and multiply VisiCalc files against other files or constants. Generate Variance reports, Statements of Changes, Company totals from Business or Products. Convert constant \$ reports to inflation adjusted using different price factors for each line. Compare alternatives on an incremental bases. Up to 15 files can be operated on in each pass. Requires Apple-soft in ROM—\$65 plus 6% PA tax. Micro Decision Systems, P.O. Box 1392, Pittsburgh, PA 15219 (412) 276-2387.

Simply enter your tax information into the easy-to-use **Tax Manager** program, then sit back and relax while it quickly computes the information and prints most of your federal income tax schedules. When tax laws change don't be concerned. With Micro Lab's Extended Warranty Plan (\$30 per year) you can update to the current version at no additional cost. You will not have to reinvest more money in a new program. Computes and prints out the 1040 form and 115 supporting forms and schedules. Automatic global recalculation of entries; recalculations linked from schedule to schedule, schedule to form—\$150 (deductible). Micro Lab, 2310 Skokie Valley Road, Highland Park, IL 60035 (312) 433-7550.

AccuRec is the integrated time recorder and wage summary program for Apple II business users. Easy to use. Enter your initial and personal ID code to clock in and out. Displays daily and weekly records. Eliminate time-consuming 10 key conversion of time cards into paychecks. Prints an accurate record of attendance and gross wages. Structure your workweek and paydays. Set overtime variables—\$79.95. Requires time/clock interface board. Individualized Operand, P.O. Box 3030, San Rafael, CA 94912 (415) 459-3383.

utility city

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The **"Slide Show"** allows you to use your Hi-Res pictures in a programmed sequence. Think of it as a standard slide show on your television with the advantage of "TV-like" special effect transitions between "slides". Twenty different transitions including: horizontal and vertical wipes, ripple effects, column wipes, etc. Works with standard Apple pictures, single or multiple disk drives. Free run, timed, keypress or game button slide advance. User friendly—not copy protected. Prints slide/transition listing—\$49.95. C&H Video, P.O. Box 201, Hummelstown, PA 17036 (717) 533-8480.

DB Master Version Three has more features than before. Now you can have computed fields—perfect for accounts receivable, inventory control and similar applications. Each record may now include up to 10 computed fields. Field values are automatically re-computed and displayed each time a record is edited. Tell DB Master which field to total and which records to use. A running summary of records found and the field's sum, average and standard deviation are displayed on the screen. New report generator option capabilities include number formatting with commas, auto-date record selection for printing daily, monthly or annual reports, printing of averages and standard deviation when printing column totals. DB Master's standard features include dynamic prompting, user designed screen forms, short form, data compaction, password file protection, multiple sort keys. Price not given. If you're a registered owner of an earlier version of DB Master, send one or both of your program diskettes, plus \$15 for an update to Version Three. Stoneware, Inc., 50 Belvedere Street, San Rafael, CA 94901 (415) 454-6500.

Muse Software offers four packages to make your office Apple II more useful: **Super-Text** word processing system is so simple to use you'll learn the basics of text editing in mere minutes. Many advanced

feature such as split screen for editing large documents, math mode for operating statistical reports, optional file linking for global search and print operations, preview mode for reviewing line endings and page breaks before printing, form letter generation and mailing list management add-on modules plus much more—\$150. **Form Letter**, an add-on module to Super-Test, allows you to print multiple letters with individual names and addresses and personal inserted paragraphs and name insertions. The program will also format and print an envelope at the end of the letter—\$100. **The Address Book** is an add-on to Super-Text that lets you add or change addresses; list phone numbers; print labels, sort addresses; access state and your category codes. Or use the Address Book alone as a simple mailing list—\$49.95. **Data Plot** converts hard-to-understand figures into clear graphics. Choose the format that works best: bar chart, line graph, scatter diagram or pie chart—all in color—\$59.95. Muse Software, 347 N. Charles Street, Baltimore, MD 21201 (301) 659-7212.

MicroFinesse provides professional financial forecasting plus full high-resolution color graphics support, including pie charts, histograms and graphs, for the financial projections you create. Menu-driven command format can also generate up to 15 user-defined reports per model, with visuals, without reprogramming. Available at your local dealer or contact: Osborne/McGraw-Hill, 630 Bancroft Way, Berkeley, CA 94710 (415) 548-2805.

Complete Mailing Label and Filing System provides dynamic file maintenance: labels 1 to 4 across, duplicate labels, customized labels, elaborate multi-level count/sorts, range sorts and partial field sorts; formatted 80-column (or more) reports. Ultra Plot is beautiful business graphics, completely menu driven (with no commands to learn). Create bar charts, stacked bar charts, scatter charts, pie charts, hi-low graphics and map charts. Interface program allows you to use your mailing system data files to create Ultra Plot data or picture files. See all of your mailing system information in graph or chart form. This utility will total and average, search, sort, and count. Also includes utilities: merge, reformat, index any field, subfile creation based on any search/sort you want. Requires Applesoft ROM, 48K, 1 or 2 disk drives, DOS 3.2 or 3.3, Muffinable. 8 Diskfills, 5 part 3-ring manual—\$175. Avant-Garde Creations, P.O. Box 30160, Eugene, OR 97403 (503) 345-3043.

The Hardisk Accounting System is a menu driven, double entry accounting system. It consists of general ledger, accounts receivable, accounts payable, in-

ventory, point of sale, sales order entry, purchase order entry, payroll, fixed asset management, and mailing labels. All modules are interactive and include complete audit trails. The businessperson will find the Hardisk Accounting System easy to use, thanks to the data entry prompts and extensive error checking. Available in UCSD Pascal for the Apple /// with Corvus or Apple hard disk or the Apple II with Corvus hard disk. Great Plains Computers, 113 Broadway, Fargo, ND 58102 (701) 293-8483.

Realty Software has released an enhanced version of the disk based **Property Management System** for tracking Income and Expenses on rental property. This system will handle a mixture of property rentals including single family homes, condominiums as well as multifamily housing. Information for each rental is kept on-line including up to three rentor names or name and address, four phone numbers, date rented, rent amount, deposits, number of returned checks plus two memo lines. This information along with rental income tracking data is stored on diskette and is easily displayed on-screen at any time for information or updating purposes. All information can be printed for a permanent record. Features display of late rents, year-to-date and monthly income, entering of expenses and operating statements for each building separately or in consolidated form. For the Apple II or Apple ///—\$375. Realty Software Company, 1116 F 8th Street, Manhattaan Beach, CA 90266 (213) 372-9419.

A new **Scientific Software Package** provides Sophisticated nonlinear least squares using Marquardt optimization strategy. Also provides curve-fitting, parameter estimation, data-fitting. In using NLLSQ it is only necessary to provide simple one-line subroutines to fit data to equations like: $y = A \exp(B + Cx) + D \exp(E + Fx)$. Almost any linear or nonlinear least squares problem can be handled, subject to limitations of memory and machine accuracy. Includes features limited previously to main-frame computing. Stores results on disk, formats output. Standard deviations in parameters. Write for free, informative manual. NLLSQ—\$125 plus \$3 handling. CET Research Group, Ltd., P.O. Box 2029, Norman OK 73070 (405) 360-5464.

Routeplanner will help anyone who plans business and sales trips, pick-up and delivery routes, van pools, transit routes or other trips containing multiple stops. Routeplanner accepts up to 21 route stops whose map coordinates are obtained from most city, state or national maps. After optional route adjustments are made, Routeplanner computes the order of stops and approximate distance for the shortest trip. Also provides a data

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Triple your data retrieval speed!

Imagine the speed of a "solid-state disk" without access delays or moving parts. Fast and reliable.

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The SVA 256K APP-L-CACHE gives you two highspeed solid state mini disks and all the functions of a 16K memory card conveniently packed inside your Apple residing in Slot 0.

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With the APP-L-CACHE you get big system performance at a micro price.

ADVANTAGES

Improve system operation:

- Add 64K to 256K bytes of memory to your Apple
- Gain up to 2 "solid-state mini disk drives" through EPROM emulation of standard DOS disk commands
- Enjoy all the functions of a standard 16K memory card
- Eliminate need to purchase an additional mini disk drive

Improve software performance:

- Enhance high speed data access and file sorting
- Compute on large data bases without mini disk delays

- Reduce disk swapping and handling
- Gain hard disk performance and the simplicity of mini floppy operation.
- Improve program development speed and lower costs
- Copy and verify disks with only one mini drive

SOFTWARE SUPPORT

You have complete compatibility with CP/M*, PASCAL¹, and the APPLE DOS* operating systems.

Pascal users gain

- Automatic load of all system files to APP-L-CACHE
- Double compilation speed
- Reduced Editor and Filer load time by 3 times
- Single mini disk drive operation

Apple DOS users gain

- Automatic initialization
- Faster program loading and file accessing

CP/M users gain

- Automatic initialization
- User selectable volume number



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*CP/M Trademark Digital Research, APPLE DOS Trademark of Apple Computer.

VisiCalc Trademark of VisiCorp.

base program which can store map locations of up to 400 accounts, streets, cities, etc. This eliminates the need to continuously refer to maps when entering data into routeplanner. Requires an Apple II with 48K Applesoft, and disk drive. Printer is optional—\$149 plus \$1.50 for shipping and handling. Columbia Software, Box 2235, 5461 Marsh Hawk Way, Columbia, MD 21045 (301) 997-3100.

The General Ledger Package by Money Disk for the small business is called No-Nonsense Books. The system is organized around 50 pre-named accounts including two checking accounts. Account and Profit Center names may be changed if desired. Maintains records of sales in five Profit Centers for retail and wholesale accounting. Also maintains complete records of each check written and all journal entries. Each transaction must be balanced before being accepted for recording directly to the ledger accounts. A 64-page user's manual is provided. Monthly entries are limited only by diskette capacity. Any record may be viewed on the screen or printed. Checkbook reconciliation for both accounts is completed on screen in just a few seconds. Account totals are maintained for year to date, current month, last month, and last year. Printed reports include Journal and check entries, Sales Summary and Inventory Turnover Report, Operating Summary, Profit and Loss by

Profit Center, Trial Balance, Formal Profit and Loss Statement, Balance Sheet, Year end Worksheet and Chart of Accounts. Requires an Apple II with Applesoft Firmware card of Apple II Plus with 48K memory, two disk drives, 132 column printer (card in slot #1)—\$225. Money Disk, P.O. Box 1531, Richland, WA 99352 (509) 943-0198.

This group of programs provides a **complete system for depreciating** up to 800 capital assets. The system capabilities provide for any of seven depreciation methods including ACRS for 1981-1985. Pick up previously depreciated items using last years tax return or your present depreciation schedule. Purchase cost or basis may be up to \$1 million for any period from one to 99 years. Calculates Investment Tax Credit, pro-rates depreciation when necessary, and allows conversion of depreciation method with Inventory, Disposed Property List and Recovered Cost List. Any report may be printed at any time. The Disposed Property List reports all items which have been sold, including the sales price, initial cost and basis, total depreciation to sale date, and tax gain or loss. The Equipment Inventory is a management tool for physical inventory and recording condition and operating status of industrial equipment. The system requires an Apple Computer with at least 32K

memory, one disk drive and an 80 or 120 column printer. A 50 page user's manual is provided—\$225. Money Disk, P.O. Box 1531, Richland, WA 99352 (509) 943-0198.

This system provides a complete **Accounts Receivable Accounting System** for up to 400 charge customers. A maximum of 2500 entries for all accounts per month may be processed. In addition to the usual account billing, recording cash received and charge sales, the program provides a means for entering sales information and printing sales invoices and packing slips. The system also prints four collection form letters and address labels for envelopes and file folders. Account balances are maintained for current month, 30, 60 and 90+ days past due for each account and grand total. Year to date and monthly total purchases, discounts, service charges and bad debts are accumulated for each account and summarized. Courtesy discounts and late payment service charges are automatically applied if previously authorized. Printed reports are automatically formatted for printers between 80 and 132 columns—\$225. Money Disk, P.O. Box 1531, Richland, WA 99352 (509) 943-0198.

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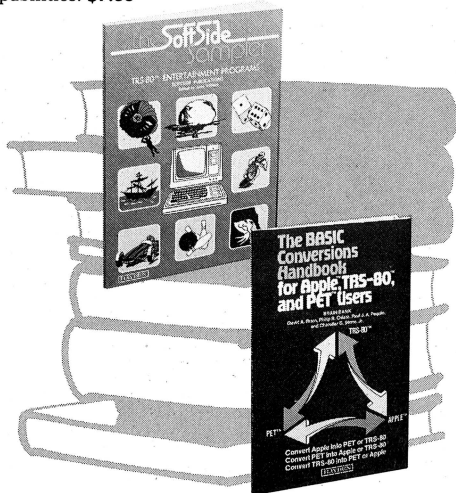
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5154-9 Basic Computer Programs for the Home (Sternberg) "This is one of the very tidiest books of its type, a model of how such books should be laid out." *Creative Computing*. Contains over 75 practical home application programs helpful to the novice or experienced owner in increasing the usefulness of any home computer. Each program is documented with a description of its functions and operation, a listing in BASIC, a symbol table, sample data, and one or more samples. **\$10.95**
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New! 5149-0 Codes, Ciphers, and Computers: An Introduction to Information Security (Bosworth) Describes the fundamentals of secret communication and provides an understanding of computer security through computer cryptography. Details and illustrates traditional cryptography techniques developed before computers and discusses more recent concepts for the highest levels of information and data security. **\$13.95**

New! 5534-X The BASIC Conversions Handbook for Apple™, TRS-80™, and PET™ Users (Brain Bank) Convert Apple II and PET programs to TRS-80, TRS-80 and PET programs to Apple II, and TRS-80 and Apple II to PET. Equivalent commands are listed for TRS-80 BASIC (Model I, Level II), Applesoft BASIC, and PET BASIC, as well as variations for the TRS-80 Model III and Apple Integer BASIC. Also describes various graphic capabilities. **\$7.95**

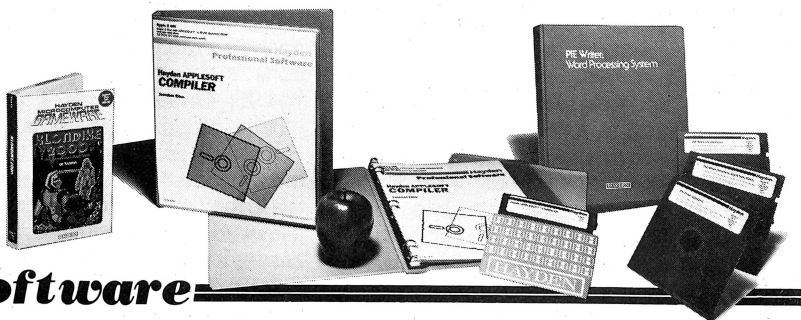


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Add memory to Persona Software's 16 sector VisiCalc program with the new **VC-PLUS program**. Add 82K or 145K of "free" memory space using one or two 64K cards from Legend. The program comes on the 128KDE card's demo diskette, and is available as an update for the 128KDE user. It also comes with the 64K card but is available for \$34.95 for single 64KC users. You will need a 48K Apple II and the Legend Industries 64KC or 128KDE card. No language or other 16K

card is needed. From your local dealer or contact: Legend Industries, Ltd., 2220 Scott Lake Road, Pontiac, MI 48054 (313) 674-0953.

Omnifile is a full featured file manager and report generator—\$49.95; **Omnitrend** is a powerful multiple regression trend analysis program with statistical calculations and extensive hi-res graphics—\$44.95; **Omnigraph** is a flexible data plotting program that allows X-Y plots, bar charts and pie charts—\$39.95. All three are available for \$99.95. Also available is the **Omnitest** educational system, which allows you to build your own question and answer files on any subject, then review them in drill or quiz game mode—\$29.95. Programs come on unlocked diskettes with listable code. Educational Computing Systems, Inc., 106 Fairbanks Road, Oak Ridge, TN 37830 (615) 483-4915.

The Phone Chronicle is a new hardware-software product that provides complete logging of pertinent data on all outgoing and incoming telephone calls. It logs date, time, number called, duration and identification code. The Phone Chronicle is available for Apple II and IBM personal computers. Consists of a plug in PC board, a complete software package, all cables and a user manual. Installation takes just a few minutes. Powered independently of the computer and operates even when the

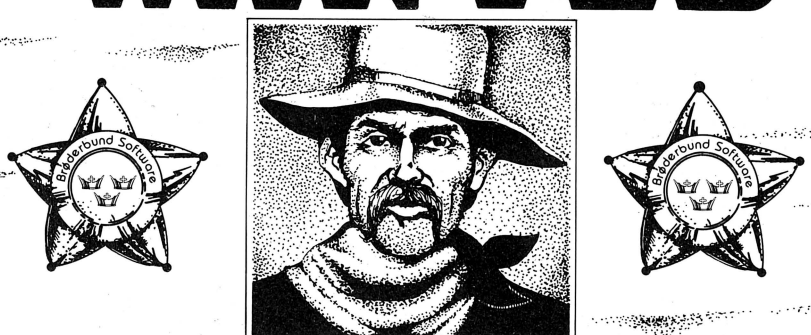
computer is turned off or when being used for other tasks. It has its own micro-processor and memory. The memory is used to buffer the call data and has a battery back up so that data is not lost during a power failure. The on-board memory holds data from 150 calls. The extensive software package provided with the Phone Chronicle handles four major functions: Data Collection and transfer from the on-board memory to a diskette, Initialization program, System editor for preparing report formats and a Report Generator. Single line unit—\$395; four line model is \$695. Sycon, Inc., 3040 Scott Blvd., Santa Clara, CA 95050 (408) 727-2751.

This Inventory and Stock Control System permits up to 2m500 stock items and 99 suppliers: this can be increased to 3,000 if less information is stored for individual stock items. Stores stock description, product code reference, supplier code and name, quantity in stock (max 9,999), date of last sale, date of last addition, level at which item should be re-ordered, quantity on order (max 9,999), date re-ordered, cost price (max \$999.99), mark-up percentage. Supplier name, quantity of each stock item sold to date is also stored. Menu driven program validates data entry. Password protected, the system includes complete documentation and user's manual—£225.00. MicroSystems Ltd, Summerfield House, Vale, Guernsey, Channel Islands, Europe—GB. (04811) 47377.

Get the facts about your stock market investments with the **Stock Portfolio System** and an Apple computer. Easy to use menu driven system with simple step by step documentation. Flexible format permits you to buy stocks or options, cash or margin, plus control your money market account. Features current portfolio status by position, total funds balances, short and long term, plus much more. Advance notice of stocks going long term; dividends coming due; and options expiring. Complete records provide profit and loss statement; dividend income; all year to date—\$149.95 plus \$2 shipping. CA residents add 6% sales tax. Requires an Apple II with 48K, 1 disk drive DOS 3.3 and applesoft in ROM. Will support a second disk and a printer. Smith Micro Software, P.O. Box 604, Sunset Beach, CA 90742 (213) 592-1032.

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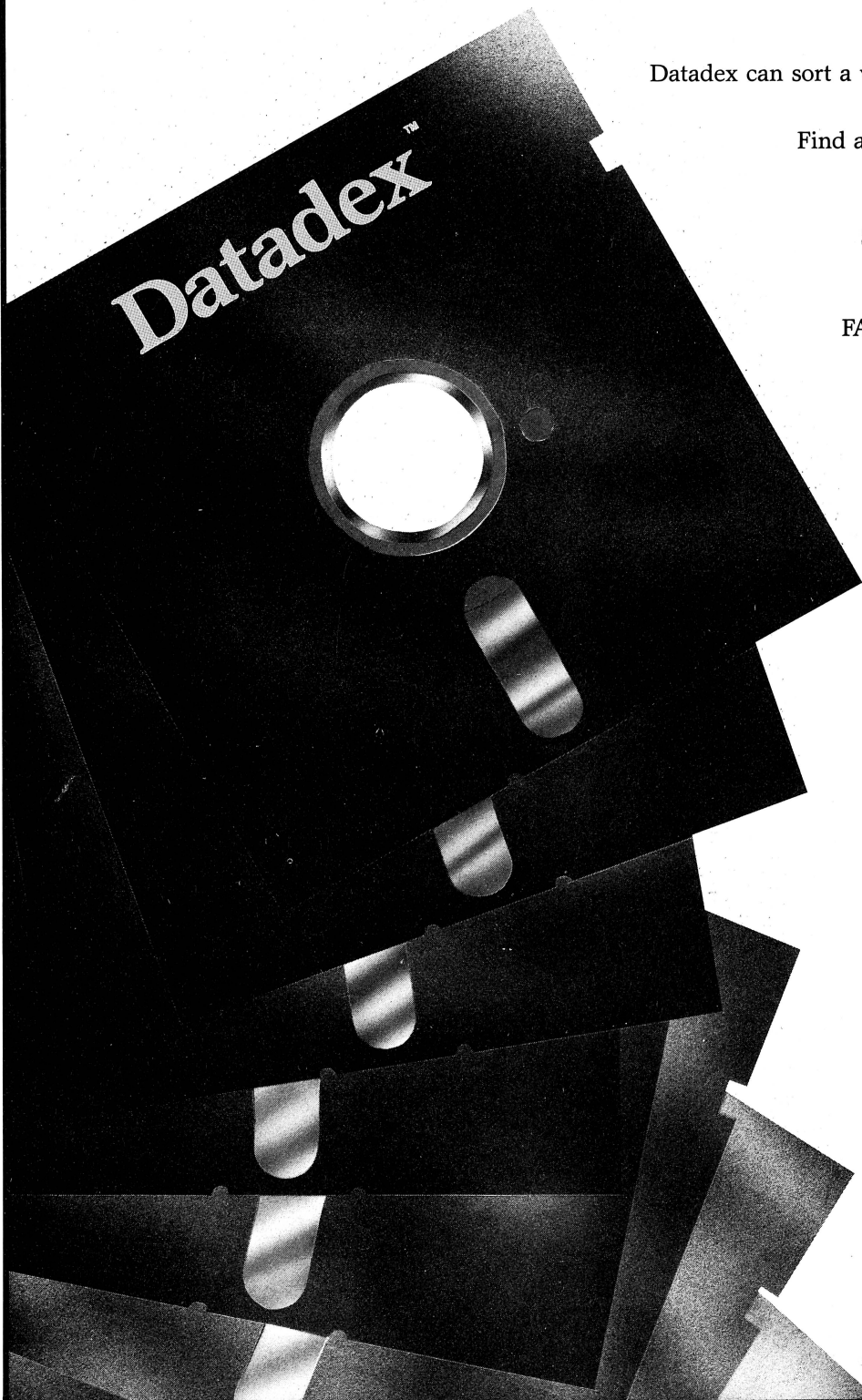
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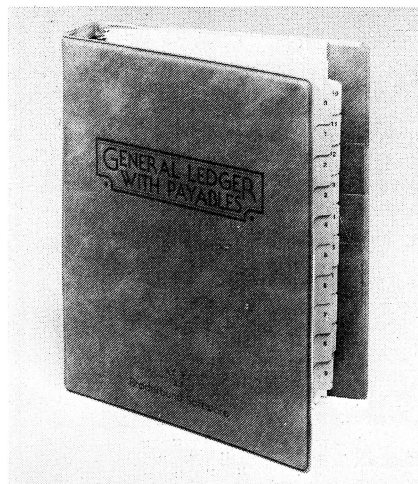
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Realty Software Company, 116 'E' 8th Street, Manhattan Beach, CA 90266 (213) 372-9419.

This program, called **Forecaster**, keeps track of one year's worth of weekly entries of data for up to 40 funds. Designed for mutual fund and money market telephone switch option investors. It uses a forward difference algorithm to predict stock market trends, and then generates buy or sell signals. The program manual is clearly written, and goes into some financial background for the benefit of the beginning investor. Detailed instructions in beginning your investment program and on the use of the Forecaster system are supplied. Features include a data plot function, automatic calculation of the percent gain or loss, and a special function that allows the user to do midweek checks on the investment without effecting the data base—\$75 plus \$2 shipping. A one year data base for 15 select funds is also available for \$20. For Apple II, TRS 80 I & II, or CP/M Basic 80. Meta Software Engineering, P.O. Box 18056, Albuquerque, NM 87185.

The **General Ledger with Payables** has a capacity of 2,000 ledger accounts, unlimited journal entries, 200 open payable accounts, 1,900 open invoices, values up to \$9,999,999,999.99, 1,000 checks per disk and user definable account numbers up to 10 digits. Prints checks, journal audit trails, balance sheets, income statements with budgets, history, month, year-to-date percentage and dollar change, department reports, check register and much more. The documentation is clearly written and segmented with tabs which correspond to numbered functions on the screen. Compatible with Brq/derbund Payroll and Accounts Receivable packages—\$495. Requires 64K Apple II or II Plus with DOS 3.3 or an Apple ///, two disk drives and a printer. Brq/derbund Software, Inc., Business Software Division, 11938 Fourth Street, San Rafael, CA 94901 (415) 456-6425.



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A new **Snow Watch Weather Emergency System** provides computerized school and business closings for use in a severe weather emergency by radio and television stations. Schools phone in unique code numbers to tell whether they are open or closed. Program completely organizes status reports and messages. Prints full or update reports for on-air use. Requires a 48K Apple with CP/M, Disk II and a printer—\$350 includes diskette, documentation, and consultation. Media Service Concepts, Inc., 1713 N. North Park, Chicago, IL 60614.

COMMUNICATIONS

With the **Morse Decoder**, you can connect your short wave CW receiver directly to any Apple II. No hardware interface is required. Software decodes Morse and prints or displays alphabetics. The package will adjust to any speed or pitch at the touch of a key. Menu driven program has many useful features. The package comes on disk or cassette with complete documentation—\$12.50. Bob Wiseman, 118 St. Andrews Drive, Cincinnati, OH 45245.

EDUCATION

Antfarm is a unique program designed to teach principles of good programming to children. Uses structured program control: sequence, selection, iteration, subprogram. Forces modularity of programs, mnemonic naming and encourages top-down design. In addition to the principles of good programming, Antfarm is fun. Kids have fun making the ant move, eat, plant, in interesting ways. Requires a 48K Apple with DOS 3.3—\$49.95. Computer Consulting, 6723 E. 66th Place, Tulsa, OK 74133 (918) 492-9036.

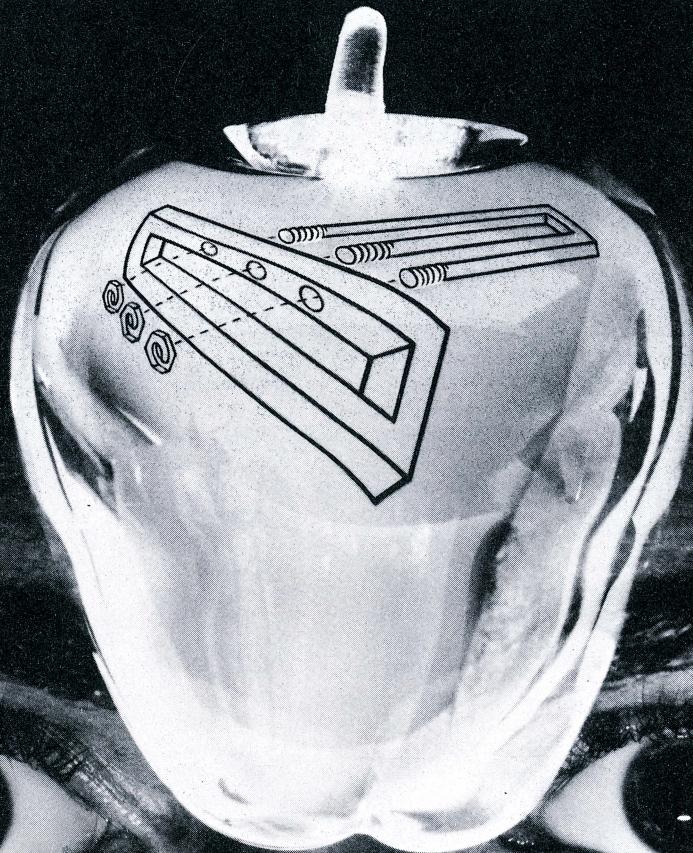
Nutrichec is a diet analysis program which features: Calculation of physical activity level from 90 activities, adaptable; food data base based on 1980 RDA contains over 600 common foods, user expandable to over 900; displays and prints intake, suggested intake, percent of suggested, and index of nutrient quality for calories, fiber, fat, protein, 5 vitamins, and 6 minerals; missing data indicated; makes bar graph for percent of suggested intake. Requires 32K DOS 3.3 with Applesoft—\$59.95. Computer Consulting, 6723 E. 66th Place, Tulsa, OK 74133 (918) 492-9036

The **Micro-Deutsch German Course** set includes 24 grammar lessons, covering all material of an introductory German course. Four test units also included. Grammar lessons use substitution transformation drills, item ordering, translations and verb drills. Drill vocabulary based on frequency lists. Suitable for use with any high school or college textbook. Extensively field tested at SUNY Stony Brook—\$179. Krell Software Corp., 21 Millbrook Drive, Stony Brook, NY 11790 (516) 751-5139.

The **College Board S.A.T. Program** confronts the user with a virtually limitless series of questions and answers. Each is based on past exams and presents material on the same level of difficulty and in the same form used in the S.A.T. Scoring is provided in accordance with the formula used by College Boards. S.A.T., P.S.A.T., N.M.S.Q.T.—Educator Edition set includes 25 programs covering Vocabulary, Word Relationships, Reading Comprehension, Sentence Completion, and Mathematics. Independent tests of S.A.T. series performance show a mean total increase of 70 points in students' scores—\$229.95. Graduate Record Exam series—Educator Edition includes 28 programs covering Vocabulary, Word Relationships, Reading Comprehension, Sentence Completion, Mathematics, Analytical Reasoning and Logical Diagrams—\$289.95. Krell Software Corp., 21 Millbrook Drive, Stony Brook, NY 11790 (516) 751-5139.

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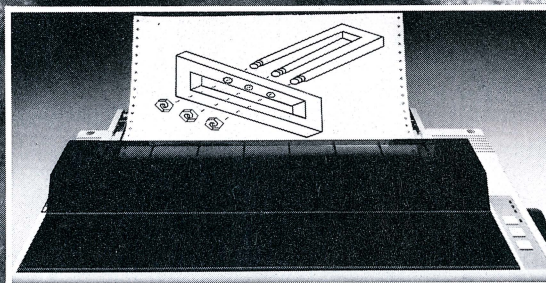
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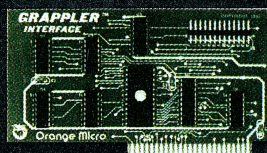
The Grappler™ is the most intelligent Apple interface available. Simple commands from the keyboard or user program, are all you need to dump screen graphics to your printer. The Grappler's exclusive EPROM chip makes high resolution graphics that easy. There are Grappler versions to accommodate the Anadex, Epson Series,* IDS Paper Tigers, Centronics 739, NEC 8023, C. Itoh Pro-writer, Okidata 82A,* Malibu 200, and future graphic printers.

*Requires Graphics Upgrade.



ACTUAL APPLE II PRINTOUT USING GRAPPLER™ AND EPSON MX100

With **The Grappler™**
Printer Interface



Orange Micro
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The Grappler's features include:

- Graphics Screen Dump
- Inverse Graphics
- Emphasized Graphics
- Double Size Picture
- 90° Rotation
- Center Graphics
- Chart Recorder Mode
- Block Graphics
- Bell Control
- Skip-over-Perf
- Left and Right Margins
- Variable Line Length
- Text Screen Dump.

The Grappler™ works with Pascal and CPM.

Intermediate and Advanced modules (available December 1982) will cover advanced topics such as movable do, rhythmic dictation, counterpoint and modulation. Built-in scoring software gives feedback at the end of sessions so that students and teachers can see progress and identify areas which have been mastered. Also includes reporting and teacher management sections—\$150. Syntauri Corp., 35006 Waverly St., Palo Alto, CA 94306 (415) 494-1017.

Dietician is a new idea for the microcomputer. Make up a diet menu with specified content of calories, carbohydrates, proteins, fats, cholesterol and sodium. The program comes complete with the composition of 700 foods. Allows you to look at the composition of each food instantaneously before deciding to include it in your diet. Make as many menus as you like, each one with your own choice of foods. Make a different menu for each day of the week or the month. Takes only minutes to make up a menu. Store the menus on the diskette or print them out. Analyze popular advertised diets. Originally written for use in a physician's office. Now made available to the public. Requires Apple II or Apple II Plus with Applesoft in ROM and one disk drive with DOS 3.3. Printer desirable. Complete with documentation—\$59.95. Dietware, P.O. Box 503, Spring, TX 77373.

Easily memorize verses of scripture with this unique **Bible Quiz** system. Enter the verses you wish to remember into the data base using the Add Verses program. The Bible Quiz program will then formulate questions on all of the verses you have selected to be quizzed on. There are five different types of questions each verse may have with a variety of different ways to ask each type: 1) reference a quoted verse, 2) give the topic of a verse number, 3) quote a numbered verse, 4) pick the verse number in a given chapter for a particular subject, 5) fill in the blanks of a verse. You may group your verses by Books of the Bible, topics, or whatever you wish. Requires DOS 3.3, or 3.3 and Applesoft ROM—\$29.95. Professional Computer Systems, 318A Lincoln Ct., Bloomington, IL 60108.

This **Diagnostic Reading Software** program is the first to use a diagnostic/remediation approach to teaching reading. PAL covers the entire scope of reading education for Grades 2 through 6. The curriculum has been validated against the top seven textbook reading series in the United States. PAL diagnoses the specific deficiencies in a child's reading ability, and prescribes remediation exercises directly targeted at the problem diagnosed. The program evaluates up to 40 major reading skills and up to 160 subskills per grade level. The Master Disk contains an

upper/lower case chip for the Apple II which allows PAL to present exercises in a "real world" format. Each reading Package contains one Discovery Disk, which performs the diagnostic testing, and one or two Learning Disks, which provides 300-400 remediation exercises for each grade level. Keeps records for up to 30 students and gives an update on each student's progress every time he/she signs on the machine—\$99.95 per package. Universal Systems for Education, Inc., 2120 Academy Circle, Suite E, Colorado Springs, CO 80909 (303) 574-4575.

Ghostwriter Authoring System allows non-programmers to easily create, modify and update sophisticated interactive video or CAI programs. Designed to to accommodate both novice and expert authors, the Ghostwriter provides graphics capability, a comprehensive word processor/text editor, unlimited branching, and scoring of responses. Unique printer capability provides authors with complete lesson listings at any time during program development and a lesson verification process identifies any errors or omissions. The Ghostwriter is offered with an on-line manual easily accessible from any point in lesson development, as well as printed documentation. Programs created with the Ghostwriter can be utilized in training, education, point-of-purchase, and other information management applications. Requires a 48K Apple II with Applesoft ROM and two disk drives and a 16K RAM card. A student station requires only one disk drive and a 16K memory card. CAVRI Systems, Inc., 26 Trumbull Street, New Haven, CT 06511 (203) 562-4979.

FINANCIAL

The Home Accountant maintains up to 100 budget categories, keeps track of up to five checkbooks. Prints checks is desired. Prints a personal balance sheet and a net worth statement. Handles cash, checkbooks, credit cards and other liabilities and expenses. Allows multiple diskettes and automatic transactions. Provides fast bank reconciliation. Custom search and retrieval of transaction information. Maintains a transaction history. Provides graphics for any category by bar graph, line graph and trend analysis—\$74.95. Continental Software, 16724 Hawthorne Blvd., Lawndale, CA 90260 (213) 371-5612.

The Accountant Version 4.4 has new features giving you more flexibility and ease of use than earlier versions. The capability to enter transactions out of sequence has been added. This new version automatically takes advantage of the extra memory made available by a 16K RAM card in Slot Zero. Names of accounts or code names may be reviewed or printed when needed.

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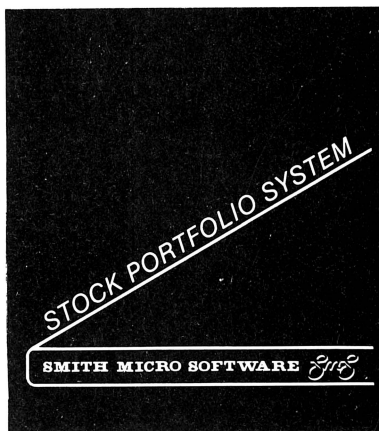
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II for Apple II

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The only intelligent SPOOLER/BUFFER with an optional REAL TIME CLOCK interface/display. For use with all Centronics parallel and RS-232C INPUT/OUTPUT interfaces.

VERSAbox's high-speed input combined with up to 60K buffer (more with character compression) frees up your computer from the slow job of printing. Modems and other compatible devices can also be buffered. Multiple software-selectable outputs permit you to choose between two or more VERSAbox outputs or use them simultaneously. You can buffer multiple inputs simultaneously too.

Add the optional REAL TIME CLOCK to VERSAbox and you get a six digit LED numeric time display. Your computer can read the time via the RS-232C port. Another useful option is the SWITCHED 120V SOCKET that can turn external devices on and off by clock control.

VERSAbox is supplied in an attractive, compact 11" wide, 8" deep, 3" high cabinet. Interface cables are available from your dealer or Prometheus. **SPECIAL OFFER** for Apple II owners: Buy a VERSAbox this month and you will receive a free parallel interface and cable.

VERSAbox, standard model with Centronics parallel INPUT/OUTPUT only and 16K buffer **\$249.00**

VERSAbox, with both Centronics parallel and RS-232C INPUT/OUTPUT and 16K buffer **\$299.00**

REAL TIME CLOCK option with DISPLAY add **\$150.00**

SWITCHED 120V OUTLET option add **\$50.00**

Additional 16K BUFFER MEMORY KITS each add **\$50.00**

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Four cards on one for Apple II. (1) Serial Input/Output Interface, (2) Parallel Output Interface, (3) Precision Clock Calendar, and (4) BSR Control. All on one card with TRUE SIMULTANEOUS OPERATION.

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II. AUTO-DOC

An automatic diagnostics system for your Apple II computer. Get a complete check of your critical Apple hardware EVERY time you power-up.

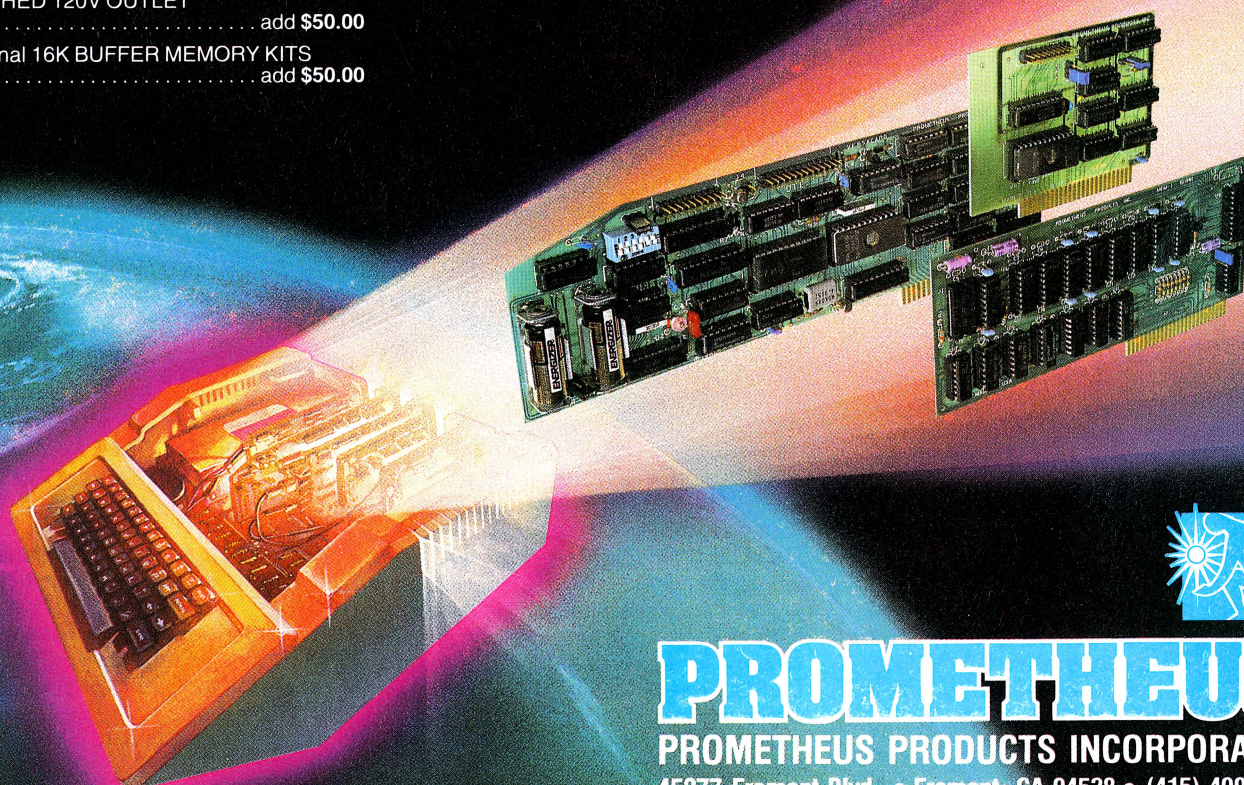
AUTO-DOC saves TIME, ENERGY, and MONEY by identifying problems in your Apple before they make themselves known by system failures. And, you don't have to remember to insert a disk. DOC automatically identifies system problems before you run your programs by doing extensive system diagnostics. If DOC finds a failure, it indicates the problem area and, in some cases, the specific chip or component that's responsible.

DOC includes a memory test, processor test, ROM test, and more. In addition, extensive disk based diagnostics are included for further testing and subsystem checks for many popular peripheral cards.

AUTO-DOC is simple and easy to install. And once installed, DOC will always be there working AUTOMATICALLY everytime you power-up.

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Another new feature permits you to "group" accounts so that the sum of the balances of a group of accounts can be displayed. One of the most powerful additions to The Accountant permits multiple automatic transaction files to be specified. A split transaction mode allows you to split one transaction into several different ones to correctly record where "lump" sums were spent, etc. Standard features of The Accountant include automatic double entry, natural language dialog, balance sheet, flexible query system, fast retrieval, data compression, interated files, memory management, on-keyboard calculator, scroll and page modes, automatic transactions, monthly summaries and output formats for either screen or printer. Complete documentation in attractive binder with demonstration data base, tutorial, and command summaries. Requires an Apple II with Applesoft in ROM and 48K of memory—\$99.95. DBCALC is an interface program designed to extract information from the Accountant's data base and create a VisiCalc file to your specifications. VisiCalc can either load the file thus created or overlay the data to a pre-formatted screen. You specify the accounts and codes for which you would like information output and the column and row for each actual and projected value to be inserted in the VisiCalc file.—\$20. (requires VisiCalc). Decision Support Software, 1438 Ironwood Drive, McLean, VA 22101 (703) 241-8316.

GAMES/SIMULATIONS

Time: June, 1943. Place: North Atlantic. The German Wolf Packs have been driven from their hunting grounds by Allied escort vessels and massive air attacks. But unknown to the Allies is a Nazi super sub completed well ahead of schedule: The Mark XXI. **Fathoms 40** makes you the German skipper of this super sub with your mission to totally destroy enemy allied merchant shipping—\$39.95. Also available: **Cloak & Dagger**, which pits you against the computer, or other players, as head of an intelligence agency trying to stay one step ahead of its rivals. Moving agents from capital to capital, ferreting information, and offering bribes are fundamental parts of each player's turn . . . and your survival—\$39.95. Horizon Simulations, 7561 Crater Lake Highway, White City, OR 97503 (503) 826-3630.

Night Mission, a beautiful and sophisticated new pinball simulation offers superior ball action and flipper control, and many subtle perfections which will result in your superior enjoyment. Night Mission permits up to 4 players—\$29.95. At your local dealer or contact: subLogic, 713 Edgebrook Drive, Champaign, IL 61820 (217) 359-8382.

The Count is a systematic approach to Blackjack play which eliminates the house edge and maximizes the player's opportunity to win. Learn in as few as two evenings! The Count teaches a basic playing strategy, without counting the cards. Instead, it teaches you a hand counting method which has been proven to give the player an edge over the casino. The Count can also be a game for the kids. Requires a 48K Apple II with DOS 3.3—\$24.95. Pear Software, 407 Terrace, Ashland, OR 97520 (503) 482-8122.

International Gran Prix, a realistic racing game, features five Grand Prix style road circuits, including: Oulton Park, Warwick Farm, Karlskoga, and Monaco. Five speed manual or automatic transmission (with or without cruise control) and eight levels of difficulty. Permit speeds to 198 MPH, controlled skids, spinouts, hairpin turns, narrow corners, obstacles, identified circuit features, "Christmas tree" controlled start, switch for silent operation, fully instrumented control panel, moving speed tape, lap counter, gear and RPM indicators, operating fuel gauge—\$30. Riverbank Software, Inc., P.O. Box 128, Denton, MD 21629 (301) 479-1312.

With **Horizon V** and **Russki Duck**, Nasir outdoes himself again; this time with three-dimensional effects in a simulated space battle that rivals the best of arcade machines. From the open plains of alien planetoids to the twisting vortex of time, Horizon V is destined to be the measure of three-dimensional simulation. Requires 48K Apple II or II Plus with a disk drive. **Russki Duck** is a real-time adventure. As a secret agent working for the DIA, you must recover the stolen LX missile plans before foreign agents can smuggle them out of the country—hidden in a duck. Requires 48K Apple II or II Plus with disk drive. Prices not given. At your local dealer or contact: Gebelli Software, Inc., 171 Tribute Road, Suite A, Sacramento, CA 95815.

In **Apventure to Atlantis**, a new fast action game by Robert Clardy, the forces of sorcery are gathering to repulse the marauding scientific Atlantean Kingdom. The epic battle can end either in the enslavement of the world or the absolute destruction of Atlantis. More color and sound, highly detailed animation, arcade-like action, true role playing, greater challenge, unending variety and endless enjoyment are yours. Requires careful planning and strategy, quick thinking and reflexes, as well as a 48K Apple II with DOS 3.3 and paddles—\$40. At your local dealer or contact: Synergistic Software, 5221 120th Ave., S.E., Bellevue, WA 98006 (206) 226-3216.

Appleopoly, a Hi-Res graphic implementation of a long-time favorite board game, provides sound effects, shows dice rolling and tokens moving. Automatically manages bank accounts—\$29.95. Requires 48K Apple II DOS 3.3. Computer Consulting, 6723 E. 66th Place, Tulsa, OK 74133 (918) 492-9036.

Midnight Magic Pinball; this amazing electronic pinball experience brings all of the fast action and tension of a real pinball game to the computer screen. For one to four players. You have flippers top and bottom, bumper action, rollovers. All the sounds of a classic arcade pinball machine. Outstanding graphics. Even permits tilting. You control the release velocity and if you're good, you can trip up to three balls for simultaneous play. Keeps a record of the top ten players (optional)—\$34.95. At your local dealer or contact: Broderbund Software, 1938 Fourth Street, San Rafael, CA 94901 (415) 456-6424.

Crossword Magic will help teach any subject at any grade level. You supply words from any subject, Crossword Magic automatically interconnects them to form a puzzle. Play your own creations on the computer or print a hard copy playable version. High resolution graphics with hard copy graphics on 20 different printers and a save game feature are standard. Develops typing skills and increases vocabulary and spelling skills—\$49.95 includes a lifetime diskette warranty. Add \$3 handling and postage. Requires an Apple II or II Plus with 48K of memory and DOS 3.3. L&S Computerware, 589 Fraser Drive, Sunnyvale, CA 94087 (408) 738-3416.

The Mate Chess System is a strategy game peripheral which comes complete with a powerful chess program on cassette: true sensor chessboard with magnetic chess pieces and available in configurations for the Apple II, Commodore Pet, and TRS 80. All you do is move the pieces. The computer will sense the move and respond through LED lights on each square of the board. Of course, the computer display screen will continue to show the game in progress. Plays world class computer chess with a top program from Applied Concepts, makers of the world-famous Boris and Morphy chess programs. Upgradable programs will be available at the same frequency that ACI upgrades its dedicated Home Chess Computers. New programs are designed consistently to maintain ACI's reputation of having the strongest chess programs available on the market. Destiny, 207 North Kirby, Garland, TX 75042 (214) 494-0281.

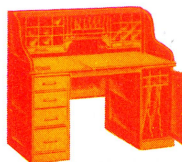
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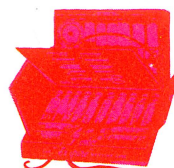
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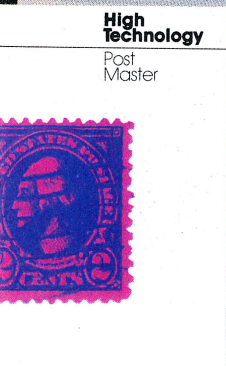
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Arcade Machine lets you create your own arcade games. No knowledge of programming necessary. Each time you use the Broderbund Arcade Machine, you will generate a new, copy-protected disk containing on it an arcade game of your own design! Your games will have the following features: Animated full-color monsters and other players as designed and drawn by you (or select from a medley of creatures on the Arcade Machine disk). Dramatic shoot-'em-up explosions and sound effects, automatic scoring and high score features, fat-loading auto-boot to title page. Colorful title page with your title and name in large graphic letters (like other Broderbund games). One or two player options, several skill levels, optional gravity effects. Menu driven for easy use, regardless of age or ability! Your arcade programs are created entirely in machine language for fast and smooth arcade-quality animation—\$44.95. Requires Apple II or Apple II Plus and one disk drive. Broderbund Software, 1938 Fourth Street, San Rafael, CA 94901 (415) 456-6424.

Computer Baseball has won Electronic Games Magazines 1982 Award for Best Computer Sports Game. Designed for the Apple II and /// home computers, Computer Baseball lets you manage your own team or an historical major league team. Each manager has a variety of offensive plays to choose from, including the suicide squeeze, bunting, stealing a base, or running the bases conservatively or aggressively, to name just a few. Defensively, he may choose between a number of ways to play his infield and outfield, choose whether or not to pitch to power hitters, and he can even go to his bullpen for a relief pitcher. The relief pitcher won't be worth much on the mound, though, if the manager has not given him sufficient time to warm up. The computer can act as manager of one team for solitaire play, or it can manage both teams at once. At your local dealer or contact: Strategic Simulations, Inc., 465 Fairchild Drive, Suite 108, Mountain View, CA 94043 (415) 964-1353.

The Road to Gettysburg is a board-assisted computer game which effectively simulates the feel of command of an American Civil War army. The only means of communication a commander has with his troops is the frustrating dispatch system that generals had to contend with in 1863. Knowledge of troop positions comes only from reconnaissance reports. Players must deal with misinterpretation of orders and even disobedience from corps commanders (played by the computer) whose abilities are based on historical factors. Weather and fatigue affect the corps' morale and may even result in

"straggling." Thus, a player must be careful about which march mode he chooses for his troops. Two scenarios are available: (1) the week long campaign allowing a great deal of movement strategy, and (2) the actual three-day Battle of Gettysburg where combat strategies prevail. There is also a solitaire scenario for players who wish to test their skills against the computer—\$59.95. Includes one diskette, rule book, player aid card, map board and 100 counters. Requires a 48K Apple II with Applesoft ROM or Apple II Plus or Apple ///. Strategic Simulations, Inc., 465 Fairchild Drive, Suite 108, Mountain View, CA 94043 (415) 964-1353.

Pursuit of the Graf Spee is a simulation of the maneuvers and battles of the famous German pocket battleship in the South Atlantic in 1939. The Graf Spee attempts to destroy as many merchant ships as possible without being sighted by Allied warships. Players experience the real feel of the chase, with each ship rated for speed and strength, with fuel restrictions and refueling capabilities, and a realistic system for visibility and sighting. The game includes a chase-oriented scenario and a combat oriented scenario simulating the Battle of the River Plate. The 19 x 19 square grid map is displayed in Hi-Res graphics—\$59.95. Requires a 48K Apple II with Applesoft ROM or Apple II Plus or Apple ///. Strategic Simulations, Inc., 465 Fairchild Drive, Suite 108, Mountain View, CA 94043 (415) 964-1353.

Audex is a collection of sound effect utility programs that allows you to create sounds, edit them, and play them back from your own BASIC or Assembly language programs. Use the keyboard and the graphics screen to "draw" sounds and edit them. These can be tones, squawks, thumps or anything you choose. You can also take sounds from the Apple cassette input and edit portions of this audio data for use as sound effects. Connect short sounds together into more complex and extended audio interludes. With it you can create warbling sounds, musical tunes and even synthesize speech. Relocatable machine language routines allow you to easily reproduce sound effects, musical tones or speech segments from within your own Applesoft programs. At your local dealer or contact: Sirius Software, 10364 Rockingham Drive, Sacramento, CA 95827 (916) 366-1195.

Killer Jellyfish? This game places you in combat with a killer jellyfish. You are racing against a rival Soviet submarine to recover valuable nuclear warheads from the ocean floor, when your encounter this substantial obstacle. Shoot them and they break into smaller pieces and keep coming (undoubtedly nuclear mutants). For one or two players in colorful high-resolu-

tion graphics. Written in machine language. Requires Apple II or II Plus with 48K and one disk drive. Playable with keyboard, Apple paddles or joystick. At your local dealer or contact: Sirius Software, 10364 Rockingham Drive, Sacramento, CA 95827 (916) 366-1195.

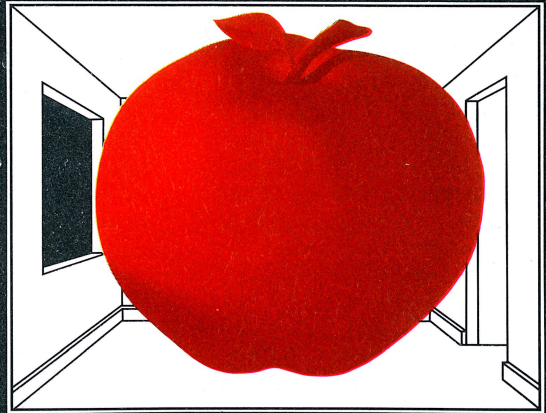
GRAPHICS

The Graphics Magician is a software package that lets you create smooth animation in your own programs. Add graphics to adventure games (or any other program that requires many pictures and objects to be easily and quickly accessible), and create and use a new type of Apple shape table. The animation routines give you the power to easily program smooth, machine language animation . . . even from BASIC. You can easily build object and path tables, then load them with our routines into your programs. These routines have the same animation techniques used in the best Apple arcade games. Includes a picture/object editor that allows you to create Hi-Res pictures and objects in over 100 colors, and save hundreds of them on a single disk to be quickly recalled and reconstructed. The shape editor allows you to create a new type of shape table that includes color and angles that are preserved on scaling and rotations. Shapes in these tables are more compact than those in normal Apple shape tables and the subroutines used to display them can be used in your own programs—\$59.95. Penguin Software, 830 4th Avenue, Geneva, IL 60134 (312) 232-1984.

The Apple Flasher, a powerful software package, is used to locate and display standard Apple II high resolution graphic files from DOS 3.3 disks. The program bypasses ordinary DOS routines in order to display files as pictures in about 1.5 seconds each. Display modes include: (1) single key selection of any file on disk, (2) continuous scan of all files on disk with new picture on screen every 1.5 seconds, (3) carousel projector simulation controlled by either of the game controllers (or the keyboard) to display screens from 1 or 2 drives with instant access to both next and previous "slide," (4) and continuous display of all screens on 1 or 2 drives (up to 30 pictures) with individual control of display time for each picture as used in advertising displays, etc. Requires Apple II Plus or Apple II with ROM Applesoft, 1 or 2 disk drives and DOS 3.3. Game controllers for projector simulation optional—\$34.50 plus \$1 handling. Crow Ridge Associates, P.O. Box 90, New Scotland, NY 12127 (518) 765-3620.

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The Z-CARD is your key to CP/M - the largest software base available with over 2,500 programs for your word processing, forecasting, data management, and accounting applications. And now the Z-CARD is available separately or as part of the total package...The New Synergizer.

For the first time ever...a Z-80 interface for the Apple II, integrated with peripheral boards to provide a powerful CP/M operating system. The new ALS SYNERGIZER adds the field-proven SMARTERM (80 column video board) and ADD-RAM (16K RAM expansion) to complete the system. SYNERGIZER software ties it all together - easy for you to learn, easy for you to use.

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application package featuring pie graphs, standard bar graphs, point and line graphs, display of any mathematical function, least squares polynomial curvefit generation, keyboard image shape tables and user tutorial, automatic graphics disk storage and recall, data file editor, automatic disk storage and recall of editor data files, overlay modes, and a graphics screen text editor. Requires Applesoft and one DOS 3.3 disk drive—\$69.95. Dickens Data Systems, 478 Engle Drive, Tucker, GA 30084 (800) 241-6753 or in GA call (404) 491-7905.

LANGUAGES/PROGRAMMING

The Applesoft Compiler (TASC) converts a standard Applesoft BASIC program into super-fast machine code. By increasing program execution speed up to 20 times, Microsoft gives you a powerful tool for Applesoft BASIC programming. TASC will compile and run larger programs than any other Applesoft Compiler. As a disk-based system, it doesn't require the simultaneous presence of compiler and program in memory. The memory you save allows you to compile significantly bigger programs. Code expansion of up to 100% severely restricts other compilers. TASC's special code compression schemes typically limit code expansion to only 25%. Chaining with COMMON allows compiled programs to share variables, so a main menu supports several programs in a single runtime environment. True Integer Arithmetic and Integer FOR...NEXT capabilities maximize the execution speed of compiled programs. TASC's near total compatibility with Applesoft speeds compilation of existing programs with little or no modification. Price not given. At your local dealer or contact: Microsoft Consumer Products, 10700 Northup Way, Bellevue, WA 98004.

The Tool takes care of the busywork of programming while you concentrate on creativity. Design attractive entry screens, validate, format, and store user input, with virtually no programming. The Tool does it for you. What used to take days—even weeks—now takes only minutes. The Tool provides an entry screen generator, a database manager, and a report formatter, each with very sophisticated capabilities such as screen editing, field formatting and entry validation, multiple disk files, Corvus or floppy support, record lengths as large as memory, fast read and write, report printing with pagination, subtotals, multiple column widths. No price given. High Technology Software Products, Inc., P.O. Box S-14665, 2201 N.E. 63rd, Oklahoma City, OK 73113 (405) 478-2105.

MAL/80 is an adaptation of SMAL, a structured macro Assembly language developed at Bell Labs in the 1970's.

Incorporates an easily-learned processor-independent symbolic notation system, closely resembling a high level language, that makes programs easy to read, debug and maintain; use of the three basic structured programming constructs BEGIN...END, IF...THEN...ELSE, and LOOP...REPEAT; an extremely flexible, independent macro and text pre-processor which allows the programmer to create his own programming environment; a compiler/linker which permits input source and its own relocatable object code to be mixed, creating modular programs in a truly top-down fashion; an automatic translator which upgrades existing assembly language programs to SMAL/80; and more. 136-page user's guide and an abridged pocket guide. On CP/M disks for \$150, with manual. Chromod Associates, 1030 Park Avenue, Hoboken, NJ 07030 (201) 653-7615.

"Softdisk" Magazine is entirely contained on a floppy disk. The January issue featured Lisa and animated Hi-Res photographs, 21 subscriber-contributed programs—seven games, four novelties, three Hello programs, two for teachers, three utilities, two for home and business. Subscription cost is \$10 for the first issue you order and \$5 for each succeeding issue when the prior diskette is returned. Soft Disk 3811 St. Vincent, Shreveport, LA 71108.

This is the first full-scale, commercial implementation of **Modula-2**, a simple but powerful new programming language designed for the Apple II. Modula-2 is a high-level language designed by Pascal's creator, Niklaus Wirth of the Federal Institute of Technology in Zurich. Features provided by Modula-2 include modules, processes, separate compilation, dynamic array parameters, and low-level machine access. Requires a 64K Apple II with the Apple Pascal operating system. The compiler accepts the full Modula-2 language with minor implementation restrictions. Programs are compiled into p-code. Separate compilation is fully supported, with up to 50 separately compiled modules per program. No linking is required; module binding is performed at run time. Modula-2 consists of a p-code interpreter (which is upward compatible with the Apple Pascal interpreter), a fast, one-pass compiler, a library management utility, and a standard module library. Modules provided include I/O, strings, storage allocation, program loader, process scheduler, and mathematical functions—\$550. Volition Systems, P.O. Box 1236, Del Mar, CA 92014 (714) 457-3865.

UTILITIES

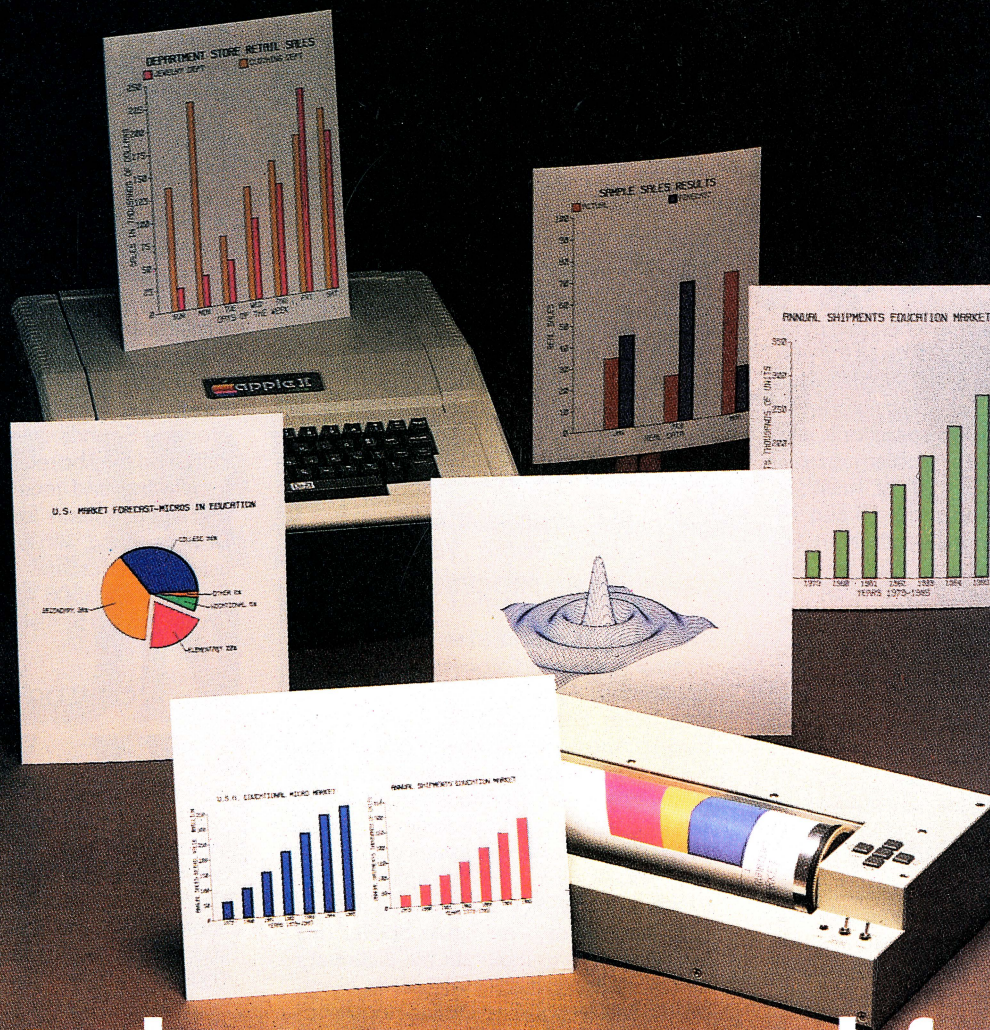
Disk Library is an elegant, user-oriented system for creating and maintaining a thorough, cross-referenced index of all

your disk-based programs and data files. It provides for automatic entry into your library file of the full catalog of any Apple diskette. Disks formatted under other operating systems (such as Pascal and CP/M) are easily entered from the keyboard. Written entirely in machine code, Disk Library's operation is both smooth and swift. Super fast machine language sorts. Works with all disks created under DOS 3.1, 3.2, and 3.3. Block actions include global editing and deleting. Instant searches by full or partial string. 100 page user's guide provides introductory and advanced tutorials, a reference section and an applications section—\$49.95 plus \$2.50 shipping and handling. Modular Media, 11060 Paradela St., Miami, FL 33156 (305) 661-7310.

Key Perfect is a program verification tool that reads a BASIC or machine language program which you have typed in from a magazine listing and produces a Check Code table that will assist in verifying correct entry of your program. Although not all magazines publish these tables, "no-charge" copies will be made available to other magazines to encourage their use of this powerful verification method. Runs on any Apple II or Apple II Plus with DOS 3.2, 3.2.1, or 3.3, and works equally well on Applesoft programs Integer programs and any kind of binary file. The minimum system requirements are 24K of memory and one disk drive—\$29.95. At your local dealer or contact Micro-SPARC Systems Division, Dept. P, Box 325, Lincoln, MA 01773 (617) 259-9710.

Amper-Sort/Merge is a utility program that sorts from 1 to 5 standard Apple II DOS 3.3 text files in a single pass and merges them into a single file—simultaneously sorting them into ascending or descending order in up to 5 different sort fields. It processes sequential or random access text files. If the entire input files will not fit into memory, it creates and merges sorted files into a single output file. The maximum combined size of the unsorted input files is about 125K. Written in machine language to achieve exceptional speed. Compatible with most commercial data base programs that create standard Apple II DOS 3.3 text files and can be used in place of the slow BASIC sort/merge programs that are used in these data base programs. Utility/training disk and a 24-page manual—\$49.95 plus \$3 postage and handling. S&H Software, Box 5, Manvel, ND 582556 (701) 696-2574.

The Universal Boot Initializer will create a DOS 3.2.1 disk that boots directly on 13- or 16-sector systems and load a RAM Card (in 1.7 seconds) with the "missing" BASIC language and executes a BASIC, Binary or EXEC greeting program in Drive 1 or 2. Alternatively it can produce a DOS



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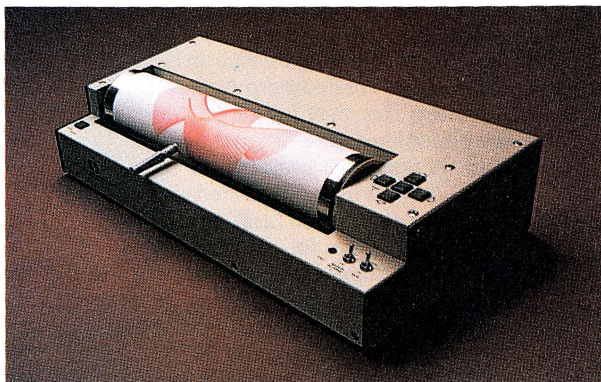
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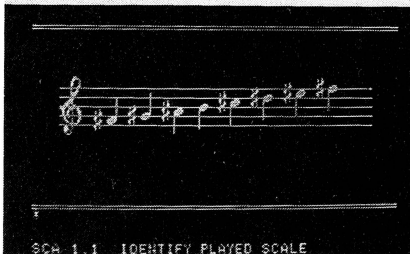
*VisiCalc is a trademark of VisiCorp.

3.3 disk that boots directly on 16-sector systems and functions similarly. In addition to creating customized or universal booting disk, the UBI Utility program uses a Directory Title Formatting procedure which allows individualization of each disk with a unique catalog title. Includes a 32-page instruction manual in addition to a training disk on the reverse of the utility disk—\$49.95 plus \$3 postage & handling. S&H Software, Box 5, Manvel, ND 58256 (701) 696-2574.

Apple-Cillin II is a comprehensive diagnostic system developed to check the performance of your Apple II or Apple II Plus and its peripherals. Apple-Cillin II will verify over two dozen hardware operations, and either identify a specific problem or give your hardware a clean bill of health—quickly and easily. Works with 13 and 16 sector drives. It is written entirely in assembly language and is compatible with any Apple II or Apple II Plus with 48K of RAM and one or more disk drives. Features linked tests, 6502 CPU test, printed results, disk speed test. Boots from any slot—\$49.95. XPS, Inc., 323 York Road, Carlisle, PA 17013 (800) 233-7512 or in PA call (717) 243-5373.

The J.O.Y. Spooler is a software program that actually lets your Apple print and compute simultaneously. You'll be able to run programs from your keyboard at the same time your printer is working. J.O.Y. is not a microbuffer. Its application is not limited to parallel printer. In fact, J.O.Y. works with any printer, card and slot. With DOS 3.3 and 48K of RAM, J.O.Y. can print text files or Applesoft program files. And it costs only a refreshing \$39.95. XPS, Inc., 323 York Road, Carlisle, PA 17013 (800) 233-7512 in PA call (717) 243-5373.

The Advanced X-tended Editor (AXE) is a professional programming aid which provides the user with a "text-editor" style extension to the standard Applesoft operating system. Operating alongside DOS, Monitor and Applesoft, AXE remains transparent to the user until called upon by one of over thirty commands. Features global search and replacement, including wildcards, selected changes, and line number references, full character insert, gobble and delete, enhanced cursor movement including search ahead and position, two packed list edit modes, recall editing modes, user programmable keyboard macros, four list formats, including unique break list format for easier reading, understanding, and editing of code. Also provides auto line numbering and lower case character entry. The resident BASIC program may be run at any time. Requires Apple II or II Plus, Applesoft ROM, DOS 3.3 and 48K RAM—\$69.95. Versa Computing, Inc., 3541 Old Conejo Road, Suite 104, Newbury Park, CA 91320 (805) 498-1956.



WORD PROCESSING

The Apple Speller interfaces to the most popular Apple word processors, including Applewriter, Apple Pie, Executive Secretary, Letter Perfect, Magic Window, and Superscribe II just to name a few. In fact, the Apple Speller can analyze the output of any editor that writes a standard Apple binary or text file to a diskette. Supplied with a 30,000+ word dictionary on a single 5¼" diskette with additional space to easily add another 8,000 words to suit your individual needs. The Apple Speller has built-in utilities to maintain the dictionary diskette. You can readily add words, delete words, and create an unlimited number of modified and/or new dictionaries for specific applications. The Apple Speller is capable of proofreading a 10 page document in 1 minute if there are no spelling mistakes and 2 minutes, 15 seconds for an unlimited number of spelling errors. Requires an Apple II or II Plus with 48K, DOS 3.3 and 1 or 2 disk drives. Two drives are required to delete or add words to the dictionary—\$75. Sensible Software, 6619 Perham Drive, West Bloomfield, MI 48033 (313) 399-8877.

LexiCom allows nearly universal transfer of word processing files. Files may be transferred back and forth between SuperText and Applewriter and any word processor that uses standard Apple text files (e.g., Superscribe, Apple PIE). In addition, the text files created from Applewriter or SuperText files may be transmitted over the phone lines using any of the communications packages available. In addition, BASIC programs can be edited with most word processors. And LexiCom offers the only possible tool for converting upper/lower case SuperText files to upper case only files—\$49.95. At your local dealer or contact Micro-SPARKC Systems Division, Dept P, Box 325, Lincoln, MA 01773 (617) 259-9710.

MUSIC

Draw Waves by Syntauri Corporation, is a sound designer system that responds to musicians' demands for unique and exciting sound design tools. Used with the alphaSyntauri digital synthesizer system, synthesists are now free to design arbitrary sounds which go beyond the limits of conventional saw/sine/square/triangle waves technology. Draw Waves lets musicians create new sounds by drawing graphical representations of complex sounds (waveforms). A microcomputer, the Apple II, performs the work of transforming the picture into sounds; the video screen provides visual feedback during the drawing process. Sounds created are stored digitally, and may be recalled at any later time for playing and recording sessions with the alphaSyntauri keyboard instrument. Draw freehand, with lines or specify vectors using X,Y coordinates—\$29.95. Syntauri Corporation, 3506 Waverly St., Palo Alto, CA 94306 (415) 494-1017.

CATALOGS/BOOKS

Programming the Apple is very easy to read and excellent for the beginning programmer. Includes over 350 figures, illustrations, tables and coding examples. Provides over 6,000 lines of written code, 12 chapters and 8 appendices. The glossary contains over 100 definitions while a bibliography provides over 60 references. 500 pages 8"x10"—\$24.95 suggested retail. Add \$2 per volume for shipping and handling. Mesa Research, Inc., Rt. 1 Box 1456A, Waco, TX 76710 (800) 824-7888 or in CA (800) 852-7777.

The International Software Directory lists tens of thousands of software packages and classifies them by machine, operating system, subject, vendor and price. Review information is also included. It is independent of both machine manufacturers and software houses and thus allows for comparison and one-stop shopping. It is backed by an excellent search service and regular updates are available from the publisher. Available in two volumes: The International Microcomputer Software Directory contains 7,000 programs and is available at the extremely competitive price of \$34.95 plus \$2.95 postage and handling; and The International Minicomputer Software Directory which is available for \$65. Imprint Software, 1520 South College, Fort Collins, CO 80524 (303) 482-5574.

The Book is a complete critical analysis of most Apple software available. Experts review, rate and evaluate the programs on 11 separate points. It covers games, education, business and utilities as well as hardware. Over 500 programs are re-

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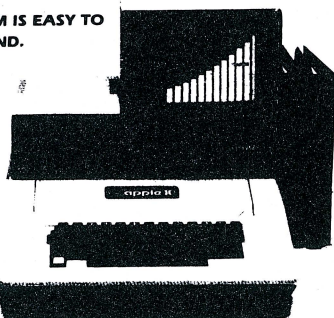
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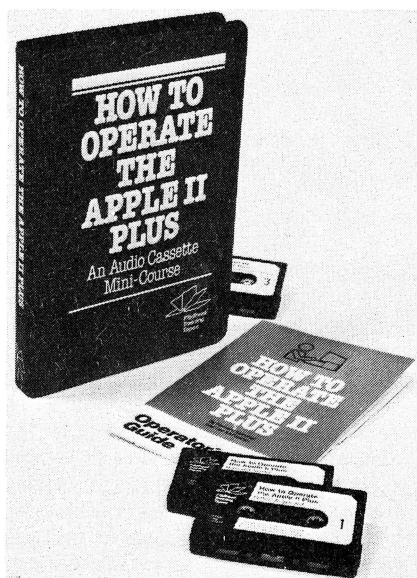
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How to Patent Computer Programs by S. Pal Asija, a patent attorney who successfully secured a patent for a program that he designed. Until now, it has been generally assumed that patent protection is not available for computer programs, which are generally referred to as "software" by the computer trade. Such programs had to be protected by trade secret and by copyright, both of which afford the program developer much less protection than is available with a patent—\$50. Research Press, Inc., 4500 W. 72nd Terrace, Prairie Village, KS 66208 (913) 362-9667.

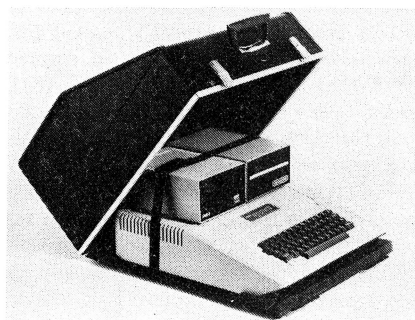


How to Operate the Apple II Plus is a new mini-course that puts an end to trial and error learning for the first-time computer user. No more fumbling through four different manuals, wondering where to begin and what is important. In just three audio cassette lessons of an hour or two each, the learner is carefully guided through the essentials of computer operations: how to run programs, enter date, save and organize files, make backup copies, modify programs and much more. No technical knowledge is assumed, and the emphasis is on basic operations, rather than on programming. Designed for junior high and up, the training package can be used again and again with students, family, colleagues, clients, staff and customers. Apple's own System Master 3.3 diskette serves as the source of all demonstration programs and utilities used in the mini-course. 28-page operator's guide is fully indexed for quick reference after the course is over. Any standard cassette player can be used, and no computer hookup is required—\$49.95. FlipTrack Training Tapes, P.O. Box 711, Glen Ellyn, IL 60137 (312) 790-1117.

The Computer Tutor: Learning Activities for Homes and Schools by Dr. Gary W. Orwig, is designed for parents to introduce their children to computing. The Computer Tutor enables everyone to join in the fun of computer play. Using easy-to-follow print-outs with numerous illustrations, parents can experiment with ways to modify their own family programs, while kids can sharpen their math and verbal skills, learn the metric system, and much more. The twenty-five programs use linear, branching, and simulation techniques including: Math Tutor, Test Tutor, Metrics, Memory Test, Trivia Quiz, Scrambled Words and 19 more. All written in standard 16K of floating point BASIC, are ready-to-run on the Apple II, TRS-80, Commodore Pet, and other microcomputers using this language—\$10.95 paperback. Little, Brown, Customer Service Department, 200 West Street, Waltham, MA 02154 (617) 890-0250.

MISCELLANEOUS

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This special **Case for the Apple II** computer also holds two disk drives (while connected). Features a foam padded interior, non-metallic hold down strap, removable locking cover, rubber no-slip bumpers on both the cover and the base, and sturdy abs plastic end-cap construction. Includes UPS delivery—\$64. Fiberbilt, 601 West 26th Street, New York, NY 10001 (212) 675-5820.

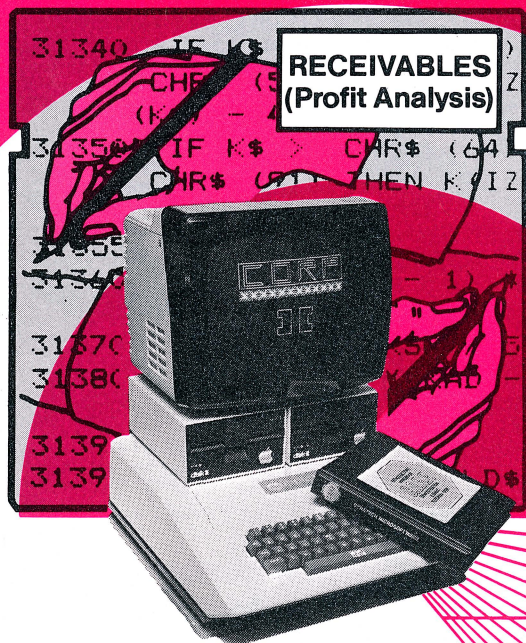
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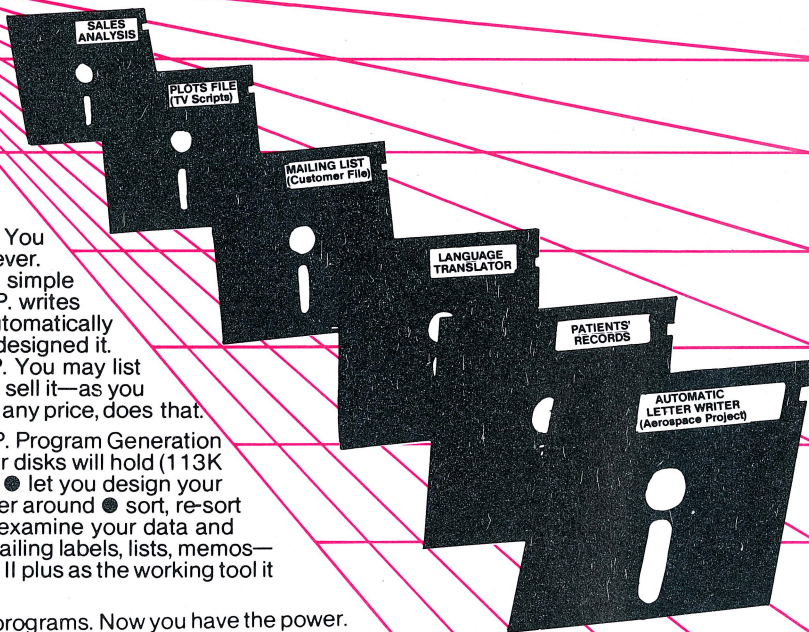
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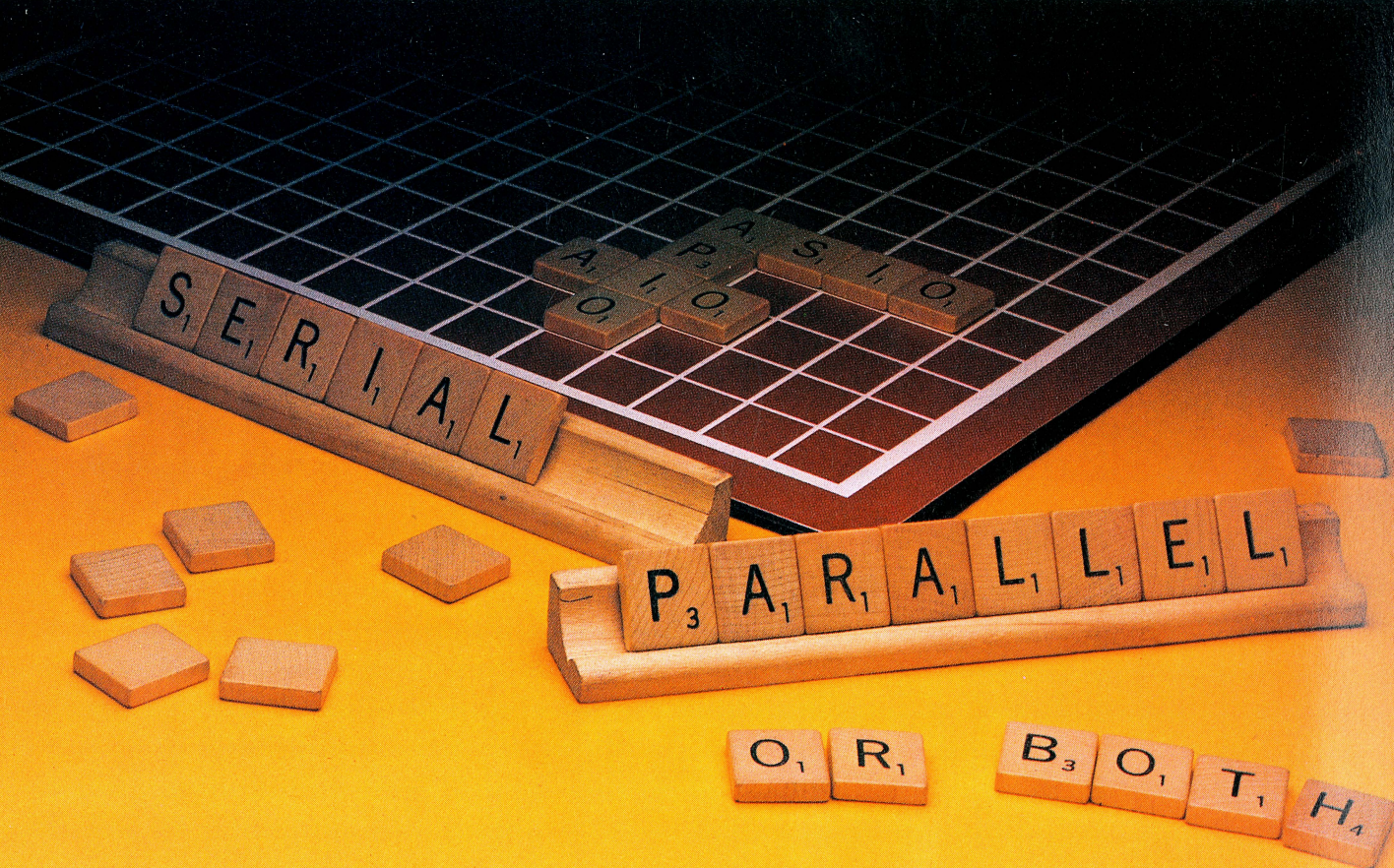
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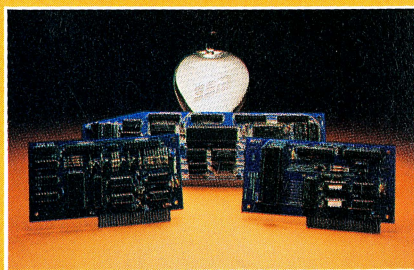
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The Transformation People

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Starfire.

The Winchester disk made just for Apple II.

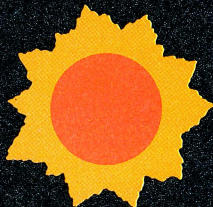
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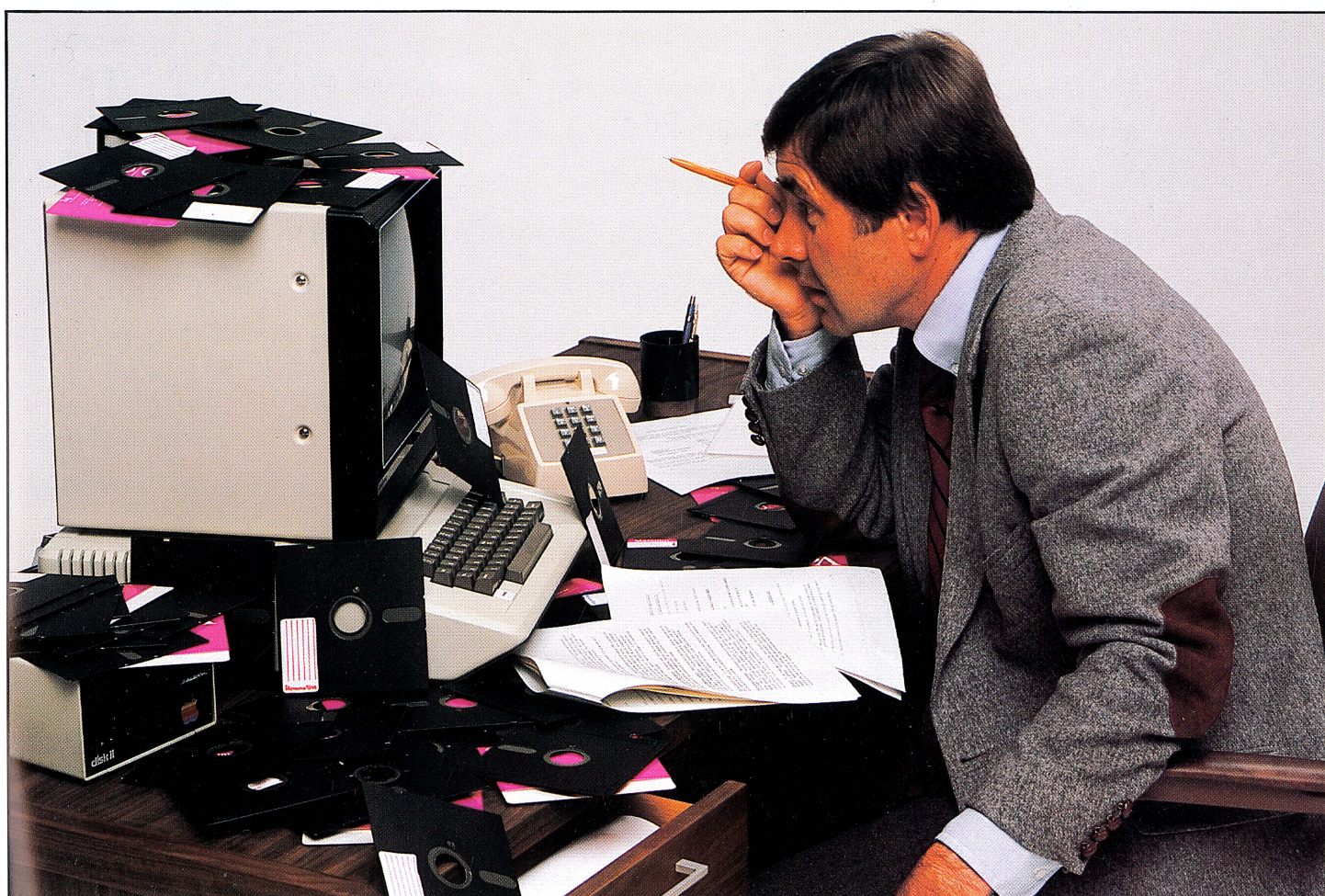
Storing all the information on a rigid disk, sealed in a contamination-proof container allows for large amount of storage, fast operation and remarkable reliability.

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Why wait? Call us at Corona now for more information. We'll tell you where to find the dealer nearest you.



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We're Corona Data Systems and we've made Starfire, a Winchester disk just for Apple II*.

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5 million characters of storage. And that's not all. You'll get Corona's Disk Partitioning which allows for up to 16 separate operating systems such as Apple DOS, CP/M* and Pascal, all sharing the same disk. Of course, you'll still be able to use DB Master* and protected software like VisiCalc*.

Double Size Volumes.

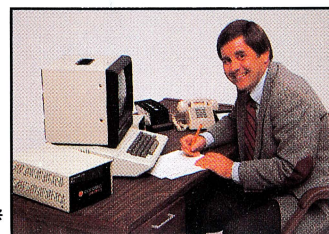
And with our Double Size Volumes, your Apple DOS is transformed into something special that offers larger data files. And you'll never have to type commands like "catalog"

and "run" or type program names again. You can even forget what volumes the programs are in.

Reliability.

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Starfire — the Winchester disk made just for Apple II.

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